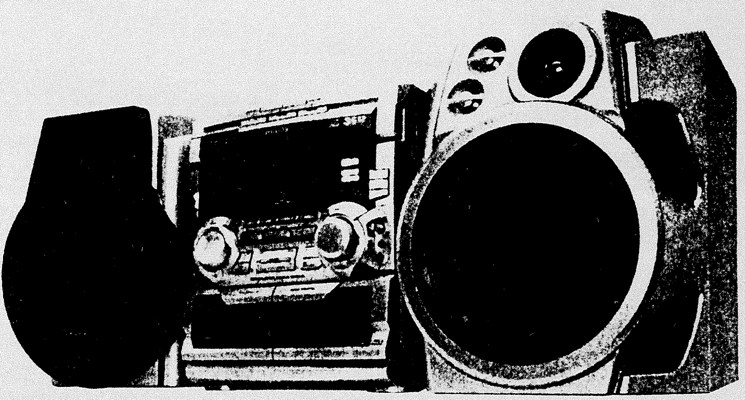
Mini System **FW830C/22/34**

FW840C/22

Service
Service
Service



Service Manual

Introduction of FW830C/22/34 and FW840C/22

For Service documentation please refer to Service Manual FW830C/21/37 - 3139 115 50090.

ReWritable CD COMPATIBLE

COMPACT disc DIGITAL AUDIO

FW830C/22 refers to FW830C/21 with the following adaptations:

1. Mechanical & Accessories

Change:	139	4822 450 10704	Window Display
	143	4822 410 12545	Button Set R/N/D
	159	4822 443 11283	Cover Cassette Left
	387	4822 736 17007	Instruction For Use
	1107	4822 146 11145	Mains Transformer

2. Front Board

Add:	1409	4822 276 13775	Tact Switch
	1410	4822 276 13775	Tact Switch
	1411	4822 276 13775	Tact Switch
	2100	5322 122 32531	100pF 5% 50V
	2101	4822 126 13695	82pF 1% 63V
	2102	4822 126 13692	47pF 1% 63V
	2107	4822 126 13196	100nF 10% 25V
	2108	4822 126 13692	47pF 1% 63V
	2109	5322 116 80853	560pF 5% 63V
Add:	2110	5322 116 80853	560pF 5% 63V
	2111	4822 124 41576	2,2µF 20% 50V
	3107	4822 051 10102	1k 2% 0,25W
	3112	4822 117 11449	2k2 1% 0,1W
	3113	4822 117 13579	220k 1% 0,1W
	3114	4822 051 10102	1k 2% 0,25W
	3115	4822 051 10102	1k 2% 0,25W
	3710	4822 117 11503	220R 1% 0,1W
	5100	4822 157 62552	Coil 2,2µH 5%
	5402	4822 242 72195	QUARZ 4,332MHz
	6406	4822 130 10792	LTL-1CHPE
	7422	4822 209 31981	SAA6579T
Change:	3660	4822 117 11383	12k 1% 0,1W
Delete:	1408 , 3116 , 3117		

3. Power5VA Module - Mains Board

Add:	1905	4822 071 55002	Fuse T5A 250V
	5901	4822 157 11832	400µH 3A

(P.T.O.)

CLASS 1
LASER PRODUCT

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GB 3139 115 50110

PCS 102 751

PHILIPS

Add:	6900	4822 130 31878	1N4003G
Change:	3904	4822 116 52244	15k 5% 0,5W
	5903	4822 146 11143	Standby Transformer
Delete:	1902 , 1903 , 1906 , 1907 , 1909 , 2904 , 2905 , 3905 , 3906 , 3920 , 5902 , 6908 , 6909 , 6910 , 7901 , 7902		

4. Tuner Board : Refer to TUNER 95 (RDS) version.

5. Tape Module : Refer to attach pages (9-1 to 9-14)
ETF5-FE DB/DD/FR Module.

FW830C/34 refers to FW830C/21 with the following adaptations:

1. Mechanical & Accessories

Change:	139	4822 450 10704	Window Display
	143	4822 410 12545	Button Set R/N/D
	159	4822 443 11283	Cover Cassette Left
	387	4822 736 17104	Instruction For Use
	1107	4822 146 11145	Mains Transformer

2. Front Board

Add:	1409	4822 276 13775	Tact Switch
	1410	4822 276 13775	Tact Switch
	1411	4822 276 13775	Tact Switch
	2100	5322 122 32531	100pF 5% 50V
	2101	4822 126 13695	82pF 1% 63V
	2102	4822 126 13692	47pF 1% 63V
	2107	4822 126 13196	100nF 10% 25V
	2108	4822 126 13692	47pF 1% 63V
	2109	5322 116 80853	560pF 5% 63V
	2110	5322 116 80853	560pF 5% 63V
	2111	4822 124 41576	2,2μF 20% 50V
	3107	4822 051 10102	1k 2% 0,25W
	3112	4822 117 11449	2k2 1% 0,1W
	3113	4822 117 13579	220k 1% 0,1W
	3114	4822 051 10102	1k 2% 0,25W
	3115	4822 051 10102	1k 2% 0,25W
	3710	4822 117 11503	220R 1% 0,1W
	5100	4822 157 62552	Coil 2,2μH 5%
	5402	4822 242 72195	QUARZ 4,332MHz
	6406	4822 130 10792	LTL-1CHPE
	7422	4822 209 31981	SAA6579T
Change:	3660	4822 117 11383	12k 1% 0,1W
Delete:	1408 , 3116 , 3117		

3. Power5VA Module - Mains Board

Add:	1905	4822 071 55002	Fuse T5A 250V
	5901	4822 157 11832	400μH 3A
	6900	4822 130 31878	1N4003G
Change:	3904	4822 116 52244	15k 5% 0,5W
	5903	4822 146 11143	Standby Transformer
Delete:	1902 , 1903 , 1906 , 1907 , 1909 , 2904 , 2905 , 3905 , 3906 , 3920 , 5902 , 6908 , 6909 , 6910 , 7901 , 7902		

4. Tuner Board : Refer to ECO5 SYS /14RDS version
2-Band, FM/MW (RDS).

5. Tape Module : Refer to attach pages (9-1 to 9-14)
ETF5-FE DB/DD/FR Module.

FW840C/22 refers to FW830C/21 with the following adaptations:

1. Mechanical & Accessories

Change:	139	3139 117 89320	Window Display
	143	3139 117 88930	Button Set R/N/D
	159	3139 117 88940	Cover Cassette Left
	350	3139 118 77200	L/R Loudspeaker Box
	387	3139 116 19260	Instruction For Use
	1107	3103 308 30280	Mains Transformer

2. Front Board

Add:	1409	4822 276 13775	Tact Switch
	1410	4822 276 13775	Tact Switch
	1411	4822 276 13775	Tact Switch
	2100	5322 122 32531	100pF 5% 50V
	2101	4822 126 13695	82pF 1% 63V
	2102	4822 126 13692	47pF 1% 63V
	2107	4822 126 13196	100nF 10% 25V
	2108	4822 126 13692	47pF 1% 63V
	2109	5322 116 80853	560pF 5% 63V
	2110	5322 116 80853	560pF 5% 63V
	2111	4822 124 41576	2.2μF 20% 50V
	3107	4822 051 10102	1k 2% 0,25W
	3112	4822 117 11449	2k2 1% 0,1W
	3113	4822 117 13579	220k 1% 0,1W
	3114	4822 051 10102	1k 2% 0,25W
	3115	4822 051 10102	1k 2% 0,25W
	3710	4822 117 11503	220R 1% 0,1W
	5100	4822 157 62552	Coil 2,2μH 5%
	5402	4822 242 72195	QUARZ 4,332MHz
	6406	4822 130 10792	LTL-1CHPE
	7422	4822 209 31981	SAA6579T
Change:	3660	4822 117 11383	12k 1% 0,1W
Delete:	1408 , 3116 , 3117		

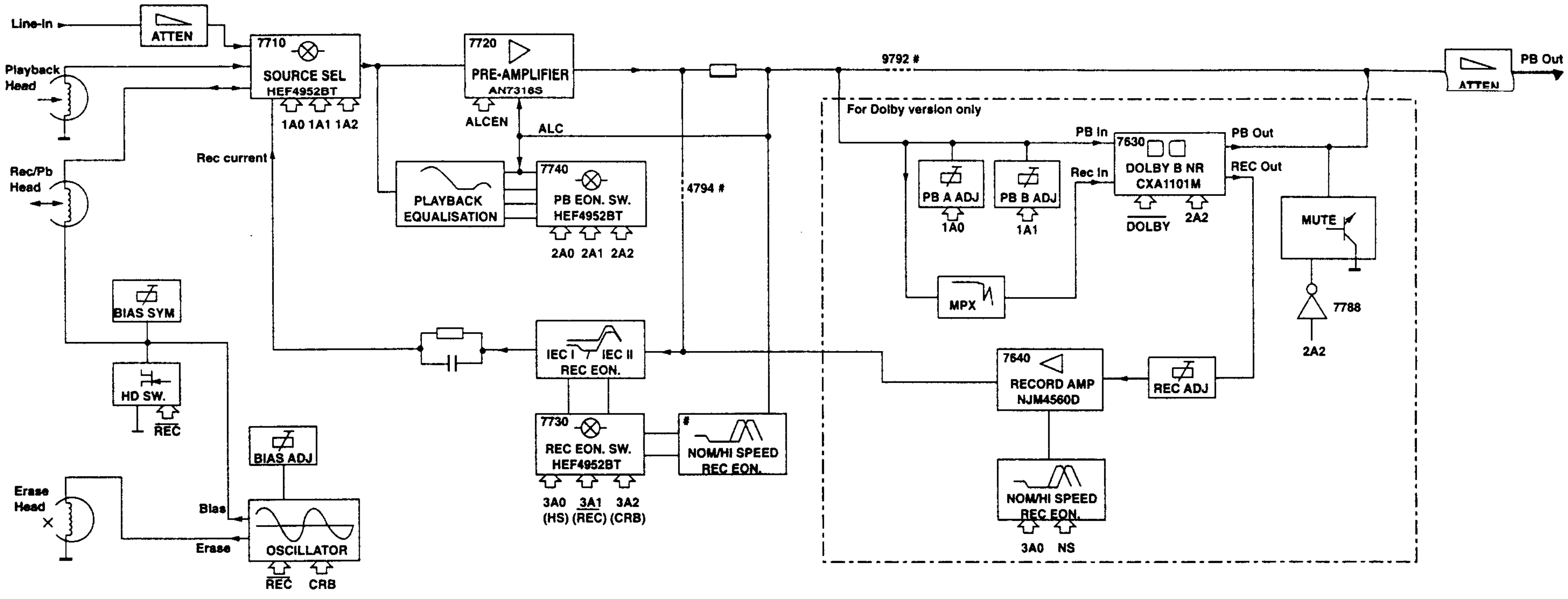
3. Power5VA Module - Mains Board

Add:	1905	4822 071 55002	Fuse T5A 250V
	5901	4822 157 11832	400μH 3A
	6900	4822 130 31878	1N4003G
Change:	3904	4822 116 52244	15k 5% 0,5W
	5903	4822 146 11143	Standby Transformer
Delete:	1902 , 1903 , 1906 , 1907 , 1909 , 2904 , 2905 , 3905 , 3906 , 3920 , 5902 , 6908 , 6909 , 6910 , 7901 , 7902		

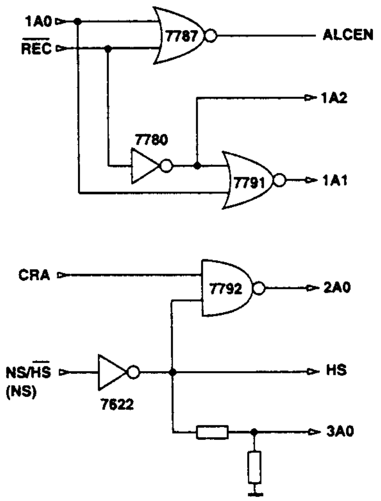
4. Tuner Board : Refer to TUNER 95 (RDS) version.

5. Tape Module : Refer to attach pages (9-1 to 9-14)
ETF5-FE DB/DD/FR Module.

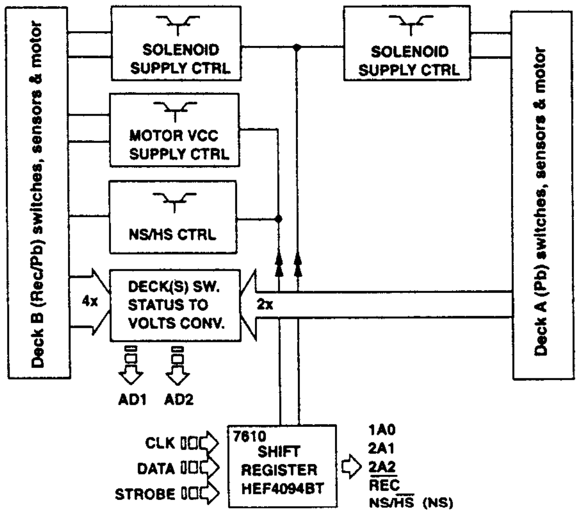
BLOCK DIAGRAM



Line-In
ATTEN
Playback Head
Rec/Pb Head
Erase Head
7710
SOURCE SEL
HEF4952BT
1A0 1A1 1A2
Rec current
7720
PRE-AMPLIFIER
AN7318S
ALCEN
ALC
7740
PLAYBACK EQUALISATION
PB EQN. SW.
HEF4952BT
2A0 2A1 2A2
4794 #
9792 #
PB Out
For Dolby version only
PB In
7630
DOLBY B NR
CXA1101M
PB Out
REC Out
Rec In
PB A ADJ
PB B ADJ
1A0
1A1
DOLBY
2A2
MUTE
7788
2A2
MPX
BIAS SYM
HD SW.
REC
IEC I
IEC II
REC EQN.
7640
RECORD AMP
NJM4560D
REC ADJ
7730
REC EQN. SW.
HEF4952BT
3A0 3A1 3A2
(HS) (REC) (CRB)
#
NOM/HI SPEED REC EQN.
NOM/HI SPEED REC EQN.
3A0 NS
BIAS ADJ
Bias
Erase
OSCILLATOR
REC CRB



1A0
REC
7787
ALCEN
1A2
7780
7791
1A1
CRA
7792
2A0
NS/HS
(NS)
7622
HS
3A0



Deck B (Rec/Pb) switches, sensors & motor
SOLENOID SUPPLY CTRL
SOLENOID SUPPLY CTRL
Deck A (Pb) switches, sensors & motor
MOTOR VCC SUPPLY CTRL
NS/HS CTRL
4x
DECK(S) SW. STATUS TO VOLTS CONV.
2x
AD1 AD2
CLK
DATA
STROBE
7610
SHIFT REGISTER
HEF4094BT
1A0
2A1
2A2
REC
NS/HS (NS)

NOTE: # For Non-dolby version only
Only 1 channel is presented.

⇨ MicroProcessor Control / Communication lines

⇨ Direct / Indirect Control lines from Shift Registers

ETF5-FE TAPE MODULE

(Dolby Version)

TABLE OF CONTENTS

Tape Module Wiring & variation table 9-1
Block diagram 9-2
Brief Introduction 9-3
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Tape adjustments & Tape deck electronics 9-5
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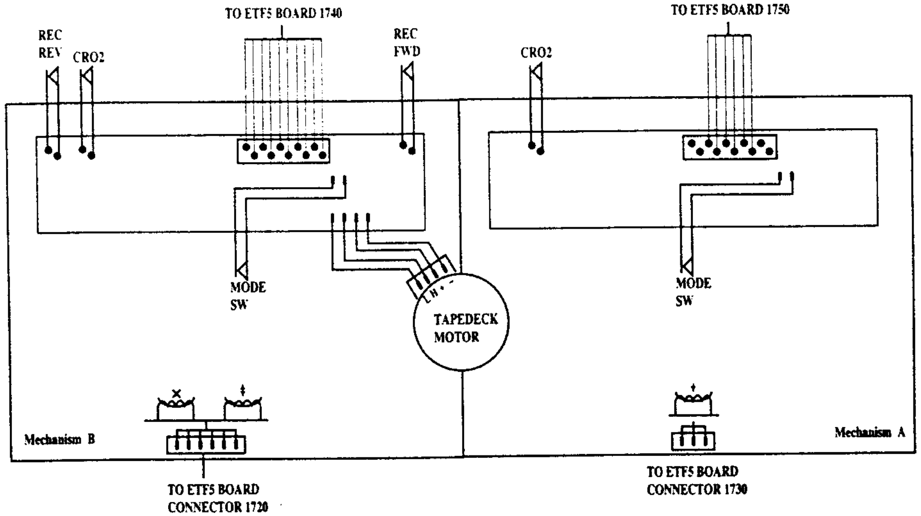
Analog Circuit diagram 9-7
Servo Circuit diagram 9-8
Dolby Circuit diagram 9-9
Exploded views & parts list 9-10
Electrical parts list 9-13

Tapedeck wiring (Double deck)



TO ETF5 BOARD 1740
REC REV
CRO2
REC FWD
TO ETF5 BOARD 1750
CRO2
MODE SW
TAPEDECK MOTOR
MODE SW
Mechanism B
Mechanism A
TO ETF5 BOARD CONNECTOR 1720
TO ETF5 BOARD CONNECTOR 1730

OPTIONS / VARIANTS TABLE

MODULE	ETF5-FE		ETF5A-FE			
VARIANT	1	2	3	4		
NAME	DB/DD/FR	ND/DD/FR	DB/DD/FR	ND/DD/FR		
Deck configuration	double	double	double	double		
Autoreverse	yes (B)	yes (B)	yes (B)	yes (B)		
Auto-replay	no	no	no	no		
Motor configuration	single	single	single	single		
Auto tape type selection	yes	yes	yes	yes		
Dolby B type Noise Reduction	yes	no	yes	no		
19 kHz pilot suppression	yes	no	yes	no		
High speed dubbing	yes	yes	yes	yes		

DB = Dolby B NR
DD = Double Deck
FF = Non-Autoreverse
FR = Autoreverse Deck B
ND = Non-Dolby
SD = Single Deck

Brief introduction

General

1. Playback Mode
   Signal from the playback head Deck A or Deck B is selected and fed through by the Mode Selector IC7710 (HEF4952B). The signal is amplified by amplifier IC7720 (AN7318S) before feeding to the IC7740 (HEF4952B) and out to the AF Board via connector 1701. For Dolby sets the signal from IC7740 will pass through IC7630 (CXA1551M) for dolby noise processing before going to the connector 1701.

2. Recording Mode
   Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952B) which is then amplified by the amplifier IC7720 (AN7318S). The amplified output signal will pass through IC7730 (HEF4952B) for record equalization and back to IC7710 (HEF4952B) before registered into the Rec/PB Head of Deck B. For Dolby sets the amplified wll pass through IC7630 (CXA1551M) for dolby noise processing, amplified to the right level by IC7640 (NJM4560M) before record equalization.

3. Dubbing Mode
   In Dubbing mode, signal from the playback head Deck A is selected and fed through by the Mode Selector IC7710 (HEF4952B) which is then equalised for playback mode by the amplifier IC7720 (AN7318S) so that a flat response is obtained after the pre-amp. The equalised signal will then follow the same path as in the Recording mode.

4. Mode Selector
   The Mode Selector IC7710 (HEF4952B) caters for 4 inputs signal, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal and Dubbing Signal.

5. Amplifier PB/REC
   Amplifier IC7720 (AN7318S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.

6. Automatic Level Control (ALC)
   ALC circuit consists of resistors (3760, 3765, 3766, 3767), capacitors (2762 , 2763) and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.

7. Muting Circuit (For Non-Dolby only)
   Switch S4 of the IC7740 (HEF4952B) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.

8. IC7740 (HEF4952B)
   The function of the IC7740 (HEF4952B) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II) during playback mode. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the Recording mode.

9. IC7730 (HEF4952B)
   The function of the IC7730 (HEF4952B) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II).

10. Bias Level
    Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.

11. Bias Symm (For Dolby only)
    Bias Symm making use of the Variable resistor (3785) to adjust the bias current for the left and the right channel to be equal.

12. PB Switch
    Playback Switch which consists of the FETs 7785 (For Dolby only) & 7786 (J111) is for the purpose of providing a virtual ground for the Rec/PB Head (Deck B) during Playback mode. During the Playback mode, the FETs are turn on and shorted pin 2 and 4 of connector 1720 to the ground. During Recording mode, the FETs are turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.

13. Muting Circuit
    The muting circuit which consists of transistors 7788, 7789 and 7790 (BC847B) is for the purpose of muting the output during Recording mode.

14. Motor Speed
    During High speed dubbing, a feedback signal from the uP through pin 03 of the IC7610 (HEF4094BT) will trigger the transistors 7622 (BC847B) and 7616 (BC857B) to cause a change in the voltage level between High and Low, thus changing the speed of the motor.

15. IC7610 (HEF4094BT)
    IC7610 (HEF4094BT) is a Shift Register use for issues the logic for cmos switch ICs (HEF4952B) via 1A0, 2A1 and 2A2. It also issues logic to On/Off SOL_A, SOL_B and MOT. Recording speed is controlled via NS/HS.

Dolby Circuit (For sets with Dolby B NR only)

16. IC7630 (CXA1551M)
    IC7630 (CXA1551M) in the Dolby circuit is a Dolby Noise Reduction Type B IC for the Playback and Recording signal. Noise Reduction ON/OFF are controlled by $\overline{\text{DOLBY}}$, which is from CLK, direct from uP. After clocking in DATA, CLK is set to HIGH/LOW for NR OFF/ON.

17. 19kHz Filter
    The 19kHz filters 5631 & 5632 (LXD-210) in the Dolby circuit is for the purpose of filtering the 19kHz Pilot Tone (for Tuner signal only) of the Recording signal.

18. Level Adjust
    The Variable resistor 3635, 3636,3641 and 3642 in the Dolby circuit is for adjusting the playback level of the Dolby reference (400Hz , 200nWb/m). Transistor 7631, 7632 are ON to enable adjustment of 3641, 3642 during Playback Deck A. Transistor 7633, 7634 and 3635, 3636 are active for Playback Deck B.

19. Amplifier IC7640 (NJM4560M)
    The Amplifiers 7640A & 7640B (NJM4560M) in the Dolby circuit is for the purpose of amplified the Recording signal.

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

CR	Chrome (IEC type II)
DB	Dolby NR type B
DD	Double Deck
DM	Double Motor
FE	Ferro (IEC type I)
FF	Non Auto Reverse
FR	Auto Reverse on Deck B
Gnd x	Ground x
HSD	High speed dubbing
ND	Non Dolby
NR	Noise Reduction
NSD	Normal speed dubbing
PB	Playback
REC	Record
S/A	Sub-assy
SD	Single Deck
SM	Single Motor

CONNECTORS ASSIGNMENTS:

CONNECTOR 1701 INTERCONNECTION TO AF BOARD

○	1	REC-L	Record input left
○	2	REC-R	Record input right
○	3	GND A	AF Ground
○	4	TAPE-L	Playback output left
○	5	+12V	D.C. supply (+12V) in
○	6	TAPE-R	Playback output right
○	7	-CMOS	Negative d.c. supply (-9V) for CMOS ICs

CONNECTOR 1703 INTERCONNECTION TO AF BOARD

○	1	GND M	Motor Ground
○	2	+MOTOR	D.C. supply (+12V) for tape deck motor & solenoid

CONNECTOR 1706 INTERCONNECTION TO FRONT BOARD

○	1	AD2	Deck sensing switches output voltage / Deck A EOT
○	2	AD1	Deck sensing switches output voltage / Deck B EOT
○	3	+5	DC supply +5V for ADC network
○	4	GND P	Control & Oscillator Ground
○	5	CLK	HEF4094BT shift register Clock line
○	6	DATA	HEF4094BT shift register Data line
○	7	STROBE	HEF4094BT shift register Strobe line

CONNECTOR 1710 DECK B HEADS CONNECTON *(For ETF6... only)*

○	1	B R/P HD L+	R/P Head left channel positive
○	2	GND A	R/P Head return ground
○	3	B R/P HD R+	R/P Head right channel positive
○	4	ERASE HEAD	Erase Head
○	5	GND A	Erase Head ground

CONNECTOR 1720 DECK B HEADS CONNECTON *(For ETF5... only)*

○	1	B R/P HD L+	R/P Head left channel positive
○	2	B R/P HD L-	R/P Head left channel negative
○	3	B R/P HD R+	R/P Head right channel positive
○	4	B R/P HD R-	R/P Head right channel negative
○	5	ERASE HEAD	Erase Head
○	6	GND A	Erase Head ground

CONNECTOR 1730 DECK A HEAD CONNECTIONS *(For Double Deck versions only)*

○	1	A PB HD L+	Pb Head left channel positive
○	2	GND A	Pb Head return ground shield
○	3	A PB HD R+	Pb Head right channel positive

CONNECTOR 1740 DECK B CONTROL INTERFACE (For ETF5... Double Deck only)

○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	3	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply	
○	6	Vcc	Deck / Motor supply	
○	7	MODE	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	
○	9	H	H pin for motor	
○	10	L	L pin for motor	

CONNECTOR 1750 DECK A CONTROL INTERFAC *(For ETF5... Double Deck only)*

○	1	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
○	2	PHOTO A	Photo sensor output (tape movement indication)	
○	3	SOL A	Solenoid supply	
○	4	Vcc	Deck/Motor supply	
○	5	MODE	Mode switch (head engagement)	[open=off: close=engaged]
○	6	GND M	Deck/Motor ground	

CONNECTOR 1760 DECK B CONTROL INTERFACE *(For Single Deck only)*

○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	3	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply	
○	6	Vcc	Deck / Motor supply	
○	7	MODE	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	

CONNECTOR 1770 DECK A & B CONTROL INTERFACE *(For ETF6... only)*

○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	3	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply for deck B	
○	6	Vcc	Deck / Motor supply	
○	7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	
○	9	L	L pin for motor	
○	10	H	H pin for motor	
○	11	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
○	12	SOL A	Solenoid supply for deck A	
○	13	PHOTO A	Photo sensor output (tape movement indication)	

TAPE MECHANISM A ELECTRONICS

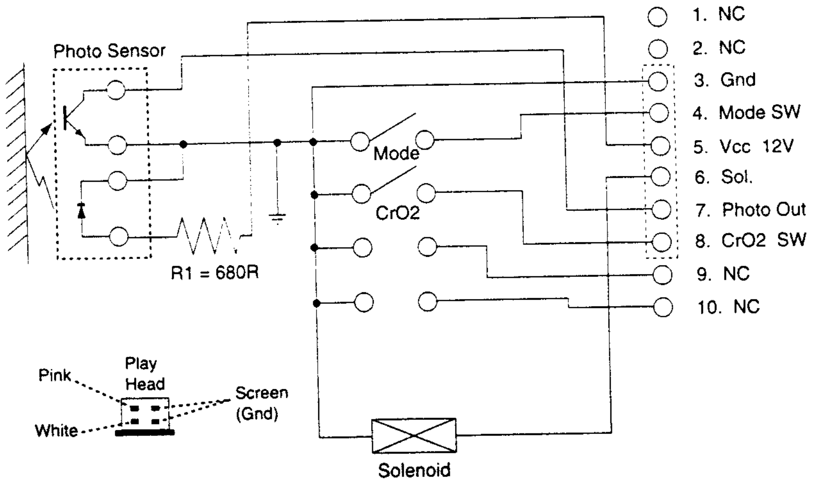
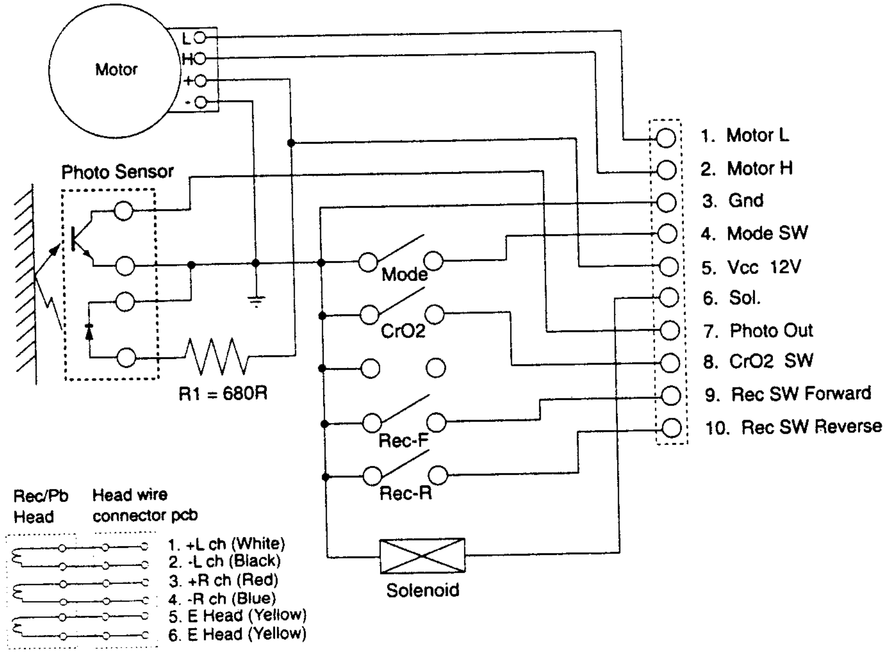


Photo Sensor
Mode
CrO2
R1 = 680R
Pink
Play Head
White
Screen (Gnd)
Solenoid
1. NC
2. NC
3. Gnd
4. Mode SW
5. Vcc 12V
6. Sol.
7. Photo Out
8. CrO2 SW
9. NC
10. NC

TAPE MECHANISM B ELECTRONICS


Motor
L
H
+
-
Photo Sensor
Mode
CrO2
Rec-F
Rec-R
R1 = 680R
Solenoid
1. Motor L
2. Motor H
3. Gnd
4. Mode SW
5. Vcc 12V
6. Sol.
7. Photo Out
8. CrO2 SW
9. Rec SW Forward
10. Rec SW Reverse
Rec/Pb Head
Head wire connector pcb
1. +L ch (White)
2. -L ch (Black)
3. +R ch (Red)
4. -R ch (Blue)
5. E Head (Yellow)
6. E Head (Yellow)

General

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
ADJUST MOTOR SPEED						
HIGH SPEED	SBC420 (4822 397 30071) 3150Hz	DUBBING	1 or 2 LEFT RIGHT	frequency counter	3622 *	5040Hz ± 0.5%
NORMAL SPEED		PLAY B			3620	3150Hz ± 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 (4822 397 30071) 3150Hz	PLAY	1 or 2 LEFT RIGHT	W&F-meter	check only	≤0.4 % DIN or ≤0.35 % CCIR *
ADJUST AZIMUTH						
DECK A & B	SBC420 (4822 397 30071) 10kHz	PLAY FWD	1 or 2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	

Playback

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
ADJUST DOLBY PLAYBACK LEVEL *						
DECK A	TCC-130 (4822 397 30269) 200nWb/m	PLAY	7 or 8 LEFT RIGHT	mV-meter	3641(L), 3642(R)	548mV ±0.5dB
DECK B		PLAY FWD			3635(L), 3636(R)	
		PLAY REV #			Check	548mV ±1dB
CHECK PLAYBACK FREQUENCY RESPONSE						
PB. FREQ. RESP.	SBC420 (4822 397 30071)	PLAY	1 or 2 LEFT RIGHT	mV-meter	Check	limits see fig.1

* For Dolby version only

# For Auto-reverse version only

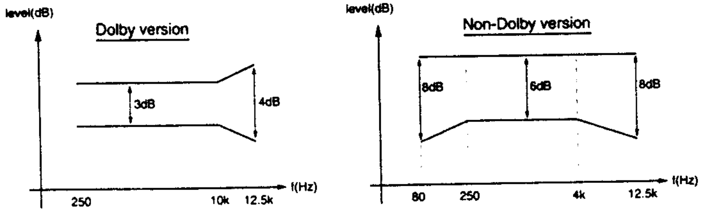


figure. 1

Recording

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	ADJUST to
PRE-ADJUST BIAS AND BIAS-SYMMETRY						
DECK B	CrO_2	RECORD	5 or 6 LEFT RIGHT	mV-meter	3773	995mV
					3785 *	left = right
	FERRO				check only	750mV ± 1.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via 3 or 4	CrO_2	RECORD				
	RECORDED CASSETTE	PLAY	1 or 2 LEFT RIGHT	mV-meter	check only	limits see fig.2
Inject 1kHz 8.85mV via 3 or 4	CrO_2	RECORD				
	RECORDED CASSETTE	PLAY	1 or 2 LEFT RIGHT	THD-meter	check only	≤3%
Remark: If high frequencies are not within limits, decrease bias and re-measure. If distortion is too high increase bias and re-measure.						
ADJUST DOLBY RECORD LEVEL *						
Inject 400Hz 8.85mV via 3 or 4	CrO_2	RECORD	9 or 10 LEFT RIGHT	mV-meter	3655 & 3556	420mV
	RECORDED CASSETTE	PLAY	7 or 8 LEFT RIGHT	mV-meter	check	170mV ± 1dB
Remark: If measured value is out, re-adjust record level up or down slightly to attain play level.						

* For Dolby version only

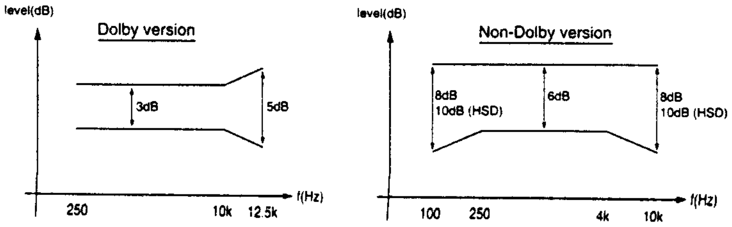
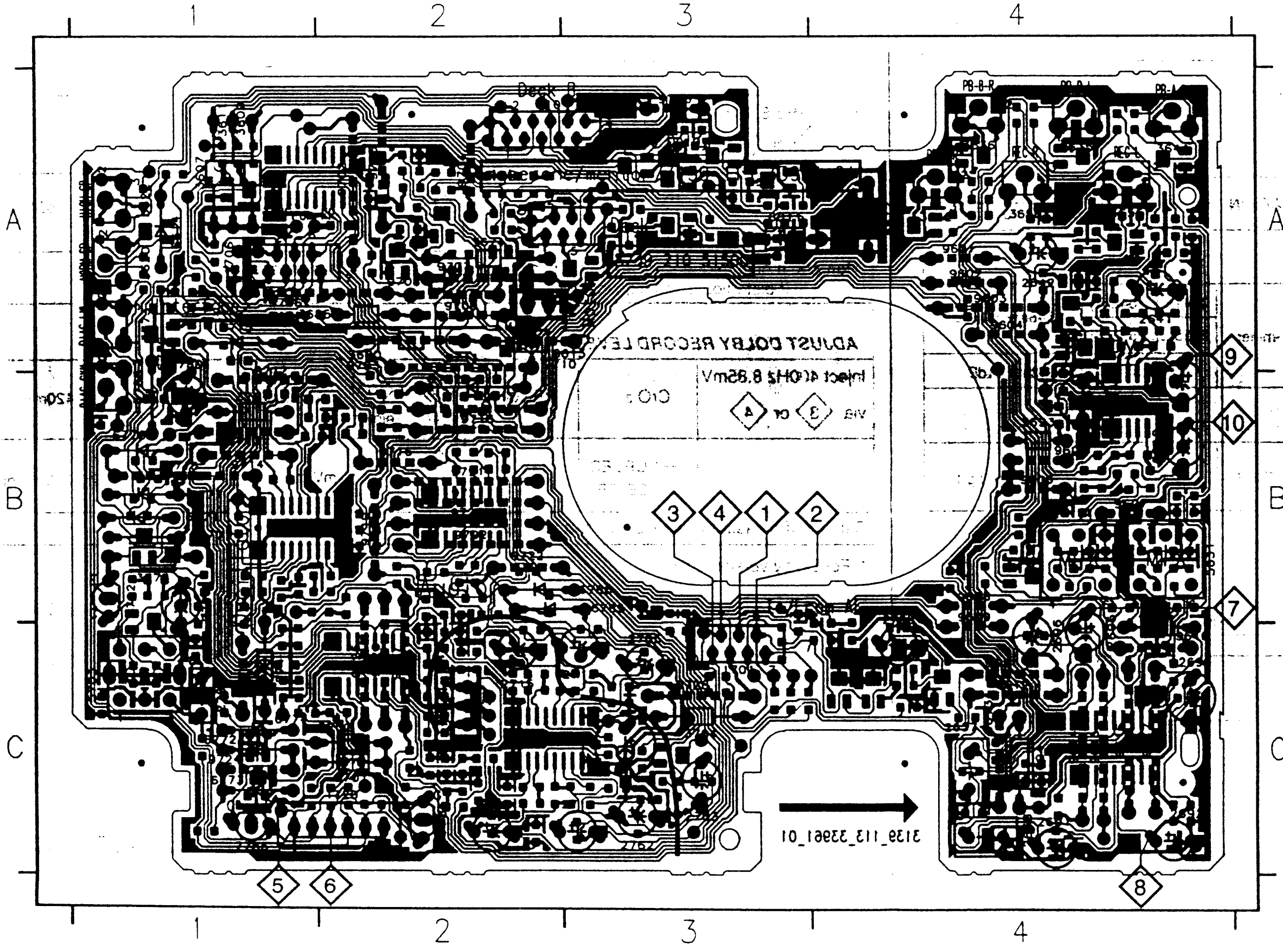


figure. 2

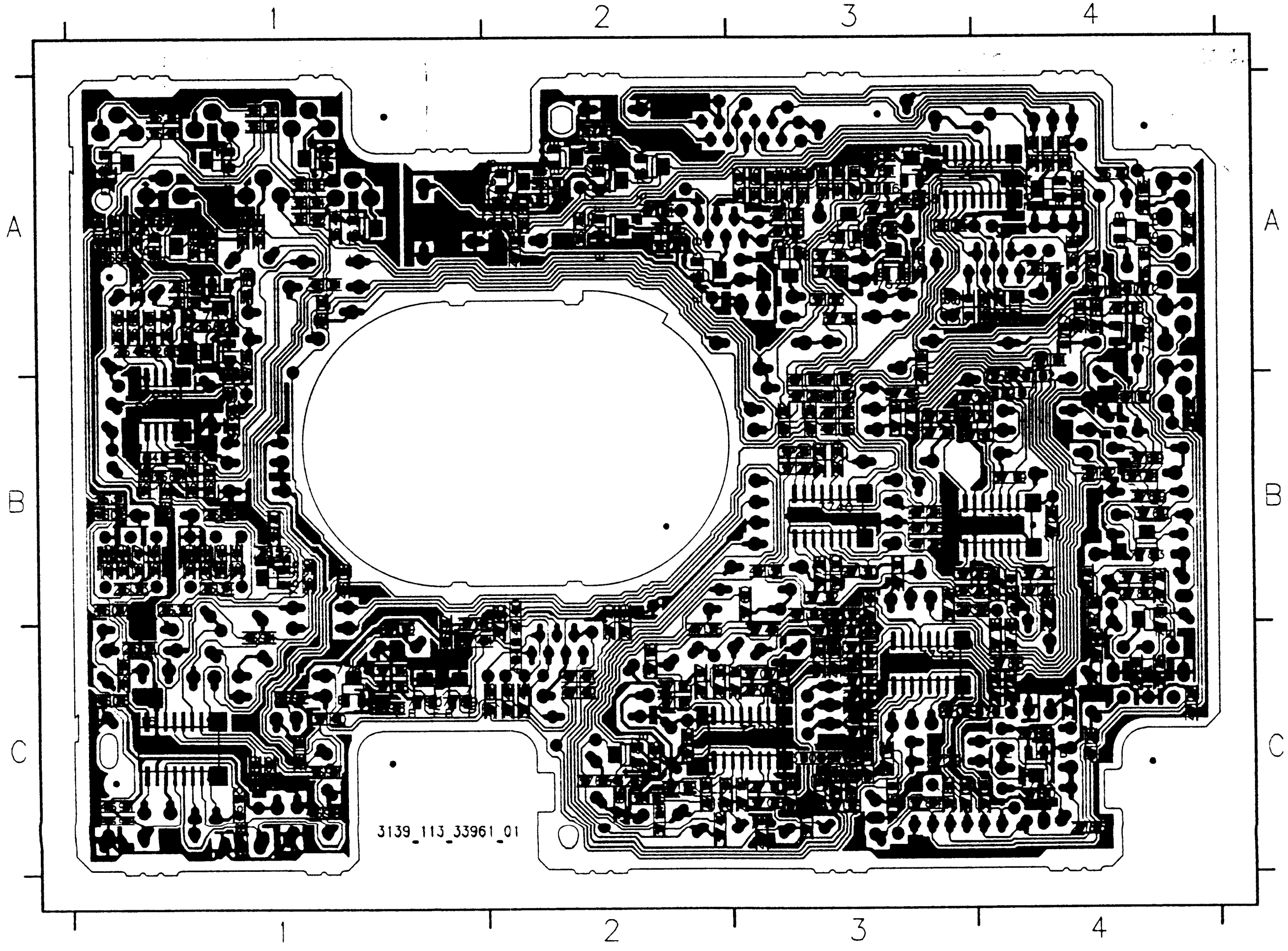
COMPONENT LAYOUT

1701	C3	2642	A4	2714	C3	2784	C1	3642	A4	3764	C3	6612	A4	6777	B1	9603	A4	9613	C4	9707	A2	9717	B2	9727	C2
1703	A3	2647	B4	2715	C2	2785	B1	3652	B4	3773	A1	6613	A3	6778	B1	9604	A4	9614	C4	9708	A2	9718	B2	9728	C3
1706	A1	2648	B4	2716	C2	3607	A1	3655	A4	3778	B1	6614	A1	6782	B2	9605	B4	9615	C4	9709	A2	9719	B2	9791	B2
1720	C2	2691	C4	2741	C1	3609	A1	3656	A4	3785	B1	6770	B1	6785	B3	9606	B4	9616	C4	9710	A2	9720	B2	9792	B2
1730	C2	2692	C4	2761	C3	3611	A1	3674	A2	5631	B4	6771	B1	6786	B3	9607	B4	9617	C4	9711	A2	9721	B2	9793	A2
1740	A3	2693	C4	2762	C3	3620	A1	3685	A1	5632	B4	6772	C1	7782	B1	9608	B4	9702	A2	9712	A1	9722	B2		
1750	A2	2694	B4	2763	C3	3622	A1	3690	A2	5701	C2	6773	C1	7785	C1	9609	B4	9703	A2	9713	B1	9723	C1		
2637	C4	2695	C4	2765	C3	3635	A4	3693	B4	5702	C2	6774	C1	7786	C2	9610	C4	9704	A2	9714	B1	9724	C1		
2638	C4	2696	C4	2768	B4	3636	A4	3694	C4	5703	C1	6775	A1	9601	A4	9611	C4	9705	A3	9715	B1	9725	C2		
2641	A4	2713	C3	2780	A1	3641	A4	3761	B1	5611	A3	6776	A1	9602	A4	9612	C4	9706	A1	9716	B2	9726	C2		

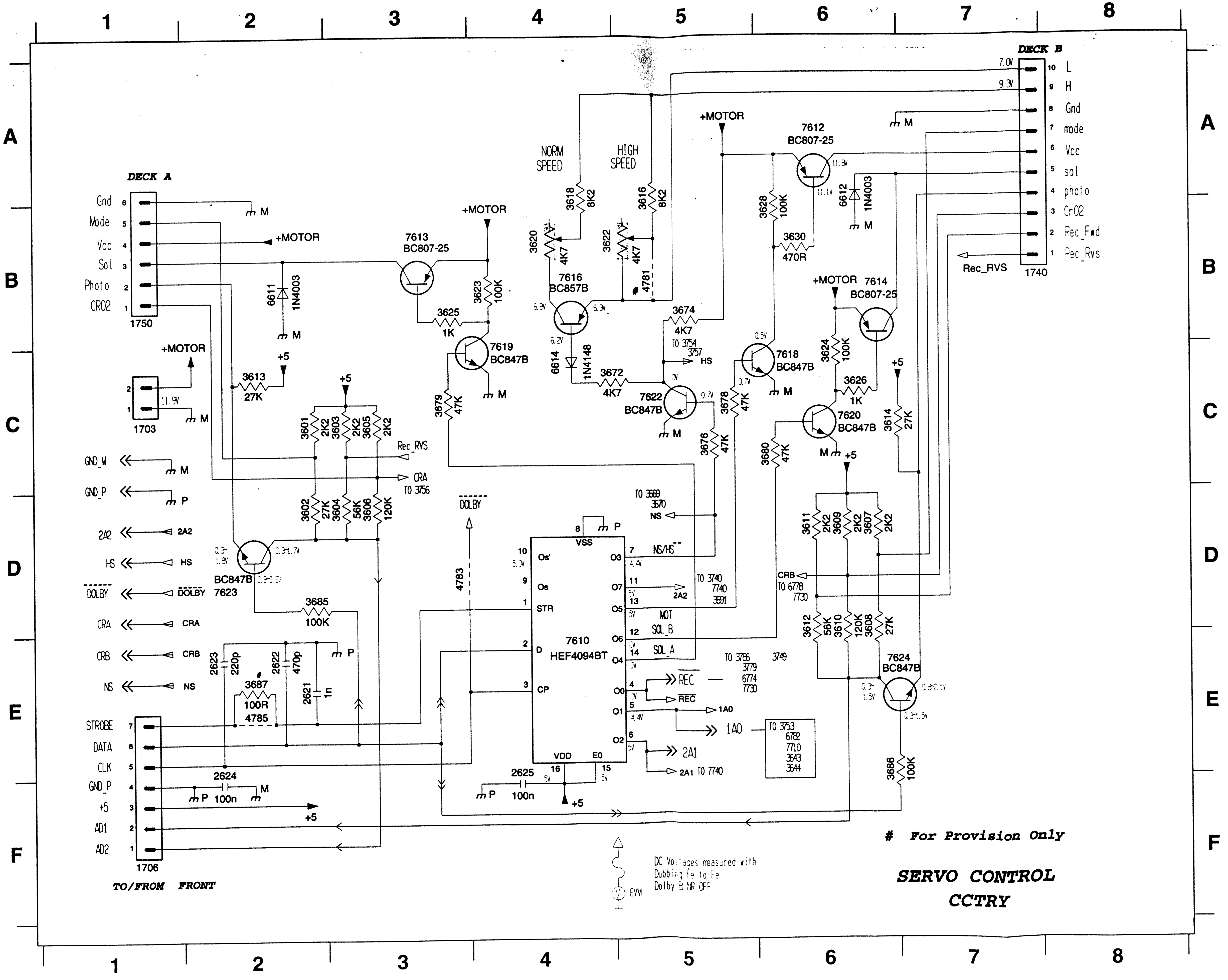


CHIP LAYOUT

2621	A3
2622	A4
2623	A4
2624	A3
2625	A4
2631	C1
2632	B1
2633	B1
2634	B1
2635	B1
2636	B1
2639	A1
2640	B1
2643	A1
2644	B1
2645	A1
2646	B1
2649	A1
2650	B1
2651	A1
2652	B1
2653	A1
2654	A1
2697	C1
2698	C1
2699	A1
2701	C4
2702	C3
2703	C3
2704	C3
2705	C3
2706	C3
2707	C3
2708	C3
2709	C3
2710	C3
2711	C2
2712	C2
2717	B3
2718	C4
2719	B4
2720	B4
2721	B3
2722	B3
2723	B3
2724	B4
2725	B4
2726	B4
2727	C4
2728	B3
2729	B3
2730	B3
2733	C2
2734	C2
2735	C3
2737	C2
2738	C2
2742	B4
2743	C4
2744	B3
2745	B1
2760	B4
2769	B2
2770	B2
2781	C4
2782	B4
2786	C4
2787	C4
2788	C1
3601	A3
3602	A3
3603	A3
3604	A3
3605	A3
3606	A3
3608	A4
3610	A4
3612	A4
3613	A3
3614	A4
3616	A4
3618	A4
3623	A2
3624	A2
3625	A2
3626	A2
3628	A2
3630	A2
3631	B1
3632	B1
3633	A1
3634	A1
3637	A1
3638	A1
3639	A1
3640	A1
3643	A1
3644	A1
3645	B1
3646	B1
3647	B1
3648	B1
3649	B1
3650	B1
3651	C1
3657	A1
3658	A1
3659	A1
3660	A1
3661	A1
3662	B1
3663	A1
3664	B1
3665	A1
3666	B1
3667	A1
3668	A1
3669	A1
3670	B1
3672	A4
3676	A3
3678	A2
3679	A2
3680	A2
3683	A1
3684	A1
3686	A4
3687	A3
3689	C1
3691	C1
3692	C1
3695	B1
3696	C1
3701	C4
3702	C3
3703	C3
3704	C3
3705	C3
3706	C3
3707	C3
3708	C3
3709	C3
3710	C3
3711	C3
3712	C3
3713	C2
3714	C2
3715	C2
3716	C2
3717	B3
3718	C4
3719	B4
3720	B4
3721	B4
3722	B4
3723	C4
3724	B3
3725	B3
3726	B3
3727	B3
3728	B3
3729	B3
3730	B3
3731	B3
3732	B3
3733	B3
3734	C3
3735	C3
3736	C3
3737	C1
3738	C1
3739	C1
3740	C1
3741	C3
3742	C2
3743	B2
3744	C1
3745	C2
3746	C2
3748	C2
3749	B3
3751	A3
3752	A3
3753	A3
3754	A3
3755	A3
3756	A3
3757	A3
3758	A3
3759	A3
3760	B3
3762	B4
3763	C2
3765	C2
3766	C2
3767	C2
3768	C2
3769	B4
3770	B4
3771	B4
3772	A4
3774	B4
3775	C4
3776	B4
3777	B4
3779	C4
3780	C4
3781	C3
3782	B4
3783	C3
3784	C3
3786	A4
3787	A4
3788	C4
3789	B4
4601	A1
4602	A1
4603	A1
4604	A1
4605	B1
4606	B1
4607	B1
4608	C1
4609	B1
4610	C1
4691	C1
4693	C1
4694	C1
4695	C1
4696	B1
4697	C1
4701	A3
4702	A3
4703	A3
4704	A2
4705	A2
4706	A2
4707	A4
4708	A4
4709	A4
4710	B4
4711	A4
4712	B4
4713	A4
4714	A3
4715	B3
4716	B3
4717	B3
4718	B3
4719	B3
4720	B3
4721	B3
4722	B3
4723	B4
4724	B3
4725	B3
4726	B3
4727	C4
4728	C4
4729	C3
4730	B3
4731	B3
4732	B3
4733	C3
4734	C3
4735	C2
4736	C3
4737	C3
4738	C3
4739	C3
4740	B2
4741	C2
4742	C2
4743	C2
4781	A4
4783	A4
4785	A3
7610	A4
7612	A2
7613	A2
7614	A2
7616	A4
7618	A2
7619	A2
7620	A2
7622	A3
7623	A3
7624	A4
7630	C1
7631	A1
7632	A1
7633	A1
7634	A1
7635	A1
7636	B1
7637	A1
7638	A1
7640	B1
7710	C3
7720	C3
7730	B4
7740	B3
7780	A4
7781	B4
7783	B4
7784	C4
7787	C2
7788	C1
7789	C1
7790	C1
7791	A3
7792	A3

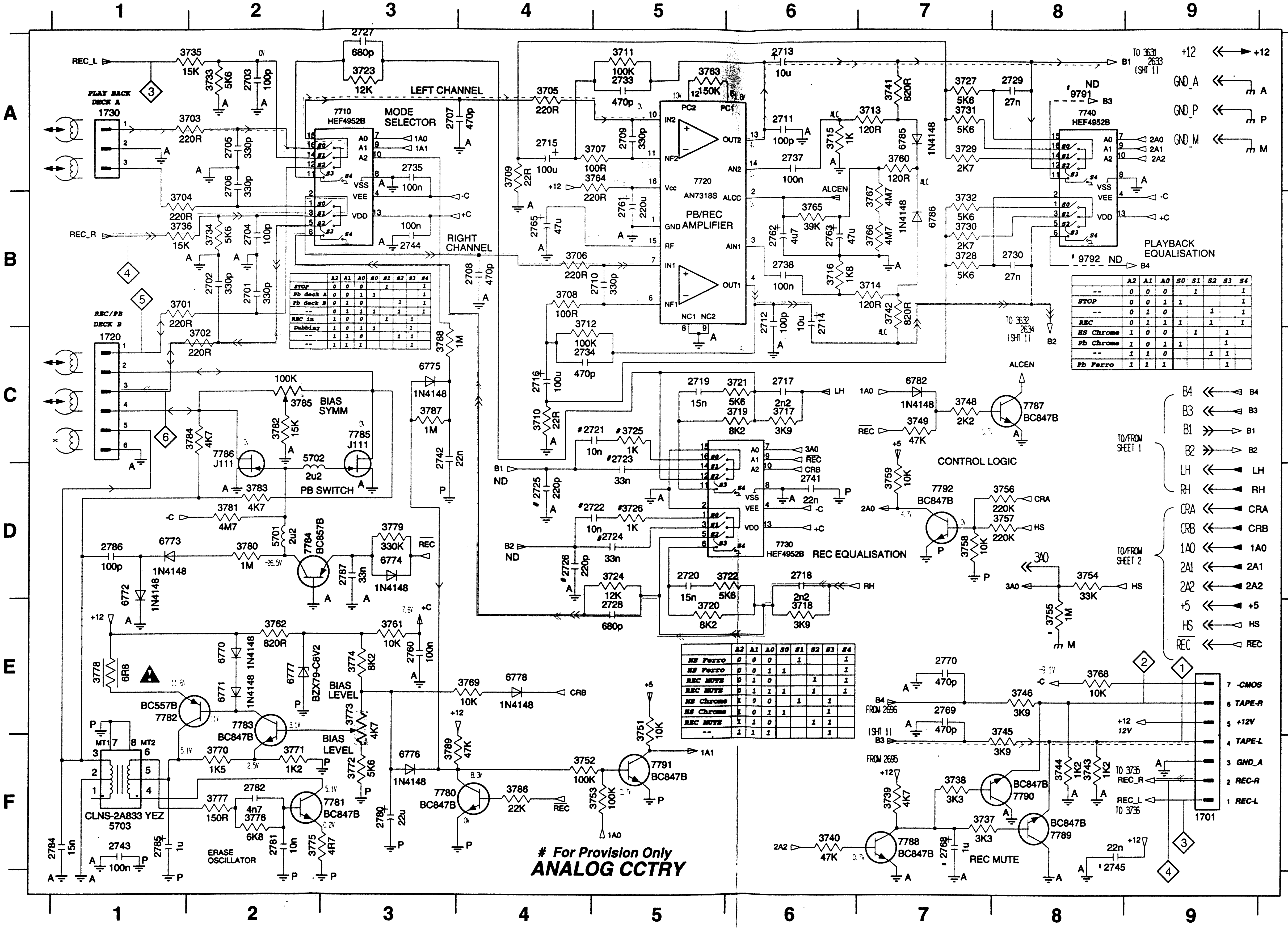


SERVO CONTROL CIRCUIT


1
2
3
4
5
6
7
8
A
B
C
D
E
F
DECK A
Gnd
Mode
Vcc
Sol
Photo
CR02
1750
+MOTOR
6611
1N4003
M
7613
BC807-25
3625
1K
3623
100K
7619
BC847B
3679
47K
1703
11.9V
+5
3613
27K
3601
2K2
3603
2K2
3605
2K2
3602
27K
3604
56K
3606
120K
Rec_RVS
CRA
TO 3756
GND_M
GND_P
2A2
HS
DOLBY
CRA
CRB
NS
P
BC847B
7623
3685
100K
2623
220p
2622
470p
2621
1n
3687
100R
4785
#
STROBE
DATA
CLK
GND_P
+5
AD1
AD2
1706
2624
100n
TO/FROM FRONT
4783
DOLBY
NORM SPEED
HIGH SPEED
3618
8K2
3616
8K2
3620
4K7
3622
4K7
4781
7616
BC857B
6614
1N4148
3672
4K7
3674
4K7
TO 3754
3757
HS
7622
BC847B
3678
47K
3676
47K
TO 3669
3570
NS
7610
HEF4094BT
VSS
VDD
Os'
Os
STR
D
CP
O3
O7
O5
O6
O4
O0
O1
O2
E0
NS/HS
2A2
TO 3740
7740
3691
MOT
SOL_B
SOL_A
TO 3786
3779
6774
7730
3749
REC
1A0
TO 3753
6782
7710
3543
3544
2A1
TO 7740
2625
100n
7612
BC807-25
3628
100K
3630
470R
6612
1N4003
7618
BC847B
3680
47K
7614
BC807-25
3624
100K
3626
1K
7620
BC847B
3614
27K
3611
2K2
3609
2K2
3607
2K2
3612
56K
3610
120K
3608
27K
CRB
TO 6778
7730
7624
BC847B
3686
100K
DECK B
L
H
Gnd
mode
Vcc
sol
photo
Cr02
Rec_Fwd
Rec_Rvs
1740
Rec_RVS
7.0V
9.3V
# For Provision Only
DC Voltages measured with
Dubbing Fe to Fe
Dolby B NR OFF
EVM
SERVO CONTROL
CCTRY

1703	C1
1706	F1
1740	B8
1750	B1
2621	E2
2622	E2
2623	E2
2624	E2
2625	E4
3601	C2
3602	D2
3603	C3
3604	D3
3605	C3
3606	D3
3607	D6
3608	D6
3609	D6
3610	D6
3611	D6
3612	D6
3613	C2
3614	C6
3616	A5
3618	A4
3620	B4
3622	B4
3623	B4
3624	C6
3625	B3
3626	C6
3628	B6
3630	B6
3672	C4
3674	B5
3676	C5
3678	C5
3679	C3
3680	C6
3685	D2
3686	E6
3687	E2
4781	B5
4783	D3
4785	E2
6611	B2
6612	A6
6614	C4
7610	E4
7612	A6
7613	B3
7614	B6
7616	B4
7618	C6
7619	C4
7620	C6
7622	C5
7623	D2
7624	E6

ANALOG CIRCUIT


1 2 3 4 5 6 7 8 9
A B C D E F
REC_L
REC_R
PLAY BACK DECK A
1730
REC/PB DECK B
1720
LEFT CHANNEL
RIGHT CHANNEL
7710 HEF4952B
MODE SELECTOR
7720 AN7318S
PB/REC AMPLIFIER
7740 HEF4952B
PLAYBACK EQUALISATION
7730 HEF4952B
REC EQUALISATION
CONTROL LOGIC
BIAS SYMM
PB SWITCH
BIAS LEVEL
ERASE OSCILLATOR
CLNS-2A833 YEZ 5703
REC MUTE
TO/FROM SHEET 1
TO/FROM SHEET 2
TO 3631 2633 (SHT 1)
TO 3632 2634 (SHT 1)
+12 GND_A GND_P GND_M
B4 B3 B1 B2 LH RH
CRA CRB 1A0 2A1 2A2 +5 HS REC
1701
7 -CMOS
6 TAPE-R
5 +12V
4 TAPE-L
3 GND_A
2 REC-R
1 REC-L
# For Provision Only
ANALOG CCTRY

	A2	A1	A0	S0	S1	S2	S3	S4
STOP	0	0	0		1			1
Pb deck A	0	0	1	1				1
Pb deck B	0	1	0			1		1
--	0	1	1	1		1		1
REC in	1	0	0		1		1	
Dubbing	1	0	1	1			1	
--	1	1	0			1	1	
--	1	1	1				1	

	A2	A1	A0	S0	S1	S2	S3	S4
--	0	0	0		1			1
STOP	0	0	1	1				1
--	0	1	0			1		1
REC	0	1	1	1		1		1
HS Chrome	1	0	0		1		1	
Pb Chrome	1	0	1	1			1	
--	1	1	0			1	1	
Pb Ferro	1	1	1				1	

	A2	A1	A0	S0	S1	S2	S3	S4
MS Ferro	0	0	0		1			1
HS Ferro	0	0	1	1				1
REC MUTE	0	1	0			1		1
REC MUTE	0	1	1	1		1		1
MS Chrome	1	0	0		1		1	
HS Chrome	1	0	1	1			1	
REC MUTE	1	1	0			1	1	
--	1	1	1				1	

-·→·- Signal path Pb left channel

—»— Signal path REC right channel

DC Voltages measured with
Dubbing Fe to Fe
Dolby B NR OFF

1701	F9
1720	C1
1730	A1
2701	B2
2702	B2
2703	A2
2704	B2
2705	A2
2706	A2
2707	A3
2708	B4
2709	A5
2710	B5
2711	A6
2712	B6
2713	A6
2714	B6
2715	A4
2716	C4
2717	C6
2718	D6
2719	C5
2720	D5
2721	C5
2722	D5
2723	C5
2724	D5
2725	D4
2726	D4
2727	A3
2728	E5
2729	A8
2730	B8
2733	A5
2734	C4
2735	A3
2737	A6
2738	B6
2741	D6
2742	C3
2743	F1
2744	B3
2745	F9
2760	E3
2761	B5
2762	B6
2763	B6
2765	B4
2768	F7
2769	E7
2770	E7
2780	F3
2781	F2
2782	F2
2784	F1
2785	F1
2786	D1
2787	D3
3701	B1
3702	C2
3703	A2
3704	B1
3705	A4
3706	B4
3707	A5
3708	B4
3709	A4
3710	C4
3711	A5
3712	C4
3713	A7
3714	B7
3715	A6
3716	B6
3717	C6
3718	E6
3719	C6
3720	E5
3721	C6
3722	D6
3723	A3
3724	D5
3725	C5
3726	D5
3727	A7
3728	B7
3729	A7
3730	B7
3731	A7
3732	B7
3733	A2
3734	B2
3735	A2
3736	B1
3737	F7
3738	F7
3739	F7
3740	F6
3741	A7
3742	B7
3743	F8
3744	F8
3745	E8
3746	E8
3748	C7
3749	C7
3751	E5
3752	F4
3753	F5
3754	D8
3755	E8
3756	D8
3757	D8
3758	D7
3759	D7
3760	A7
3761	E3
3762	E2
3763	A5
3764	A5
3765	B6
3766	B7
3767	B7
3768	E8
3769	E4
3770	F2
3771	F2
3772	F3
3773	E3
3774	E3
3775	F2
3776	F2
3777	F2
3778	E1
3779	D3
3780	D2
3781	D2
3782	C2
3783	D2
3784	C2
3785	C2
3786	F4
3787	
3788	
3789	
5701	
5702	
5703	
6770	
6771	
6772	
6773	
6774	
6775	
6776	
6777	
6778	
6782	
6785	
6786	
7710	
7720	
7730	
7740	
7780	
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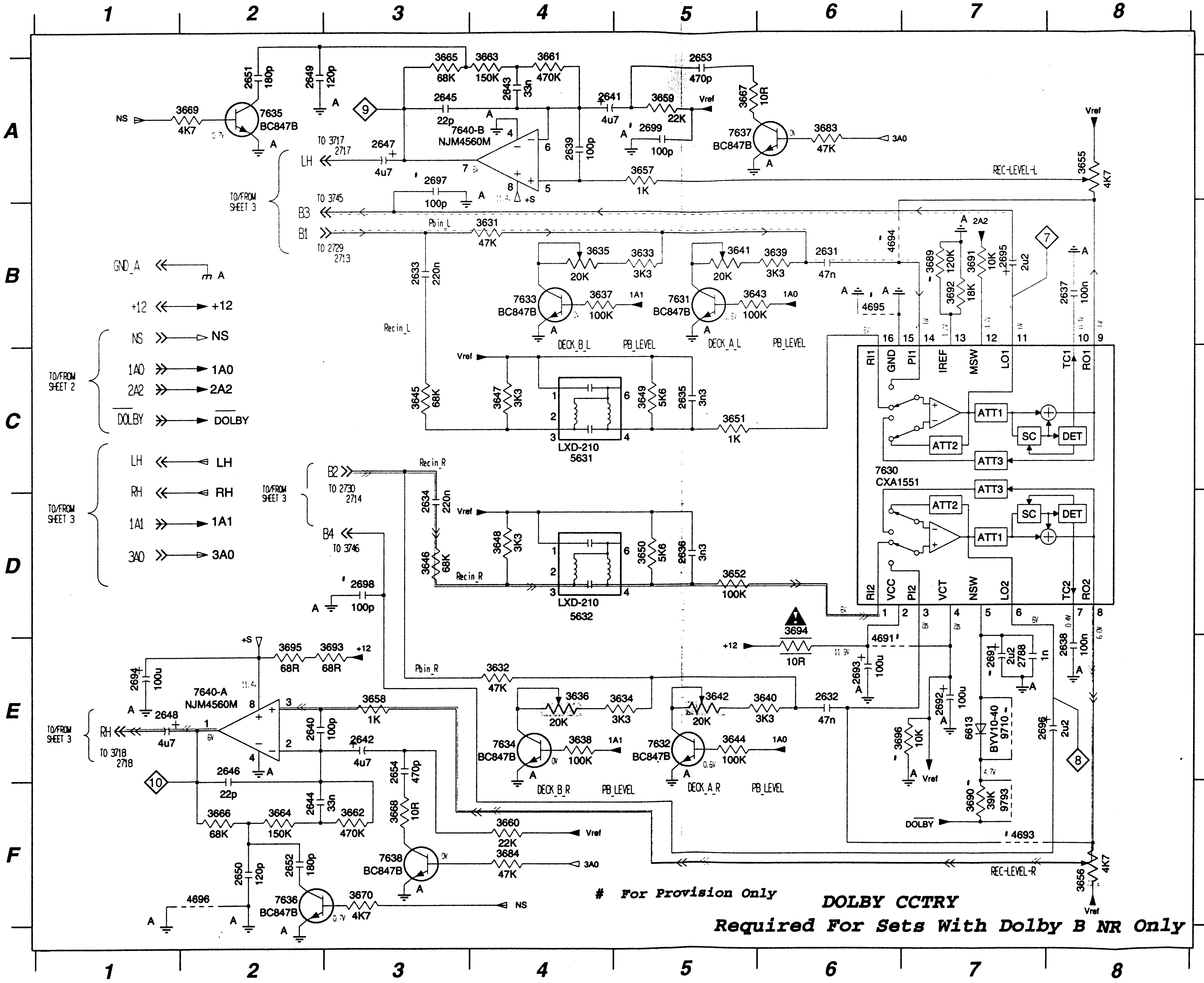
7791	
7792	
9791	
9792	

DOLBY CIRCUIT


1
2
3
4
5
6
7
8
A
B
C
D
E
F
NS
3669
4K7
7635
BC847B
2651
180p
2649
120p
9
3665
68K
3663
150K
3661
470K
2643
33n
2645
22p
7640-B
NJM4560M
2639
100p
2653
470p
2641
4u7
3659
22K
Vref
2699
100p
3667
10R
7637
BC847B
3683
47K
3A0
TO 3717
2717
2647
4u7
LH
2697
100p
+S
3657
1K
REC-LEVEL-L
3655
4K7
TO/FROM SHEET 3
TO 3745
B3
B1
TO 2729
2713
Pbin_L
3631
47K
3635
20K
3633
3K3
3641
20K
3639
3K3
2631
47n
4694
3689
120K
3692
18K
3691
10K
2A2
2695
2u2
7
2637
100n
2633
220n
7633
BC847B
3637
100K
1A1
7631
BC847B
3643
100K
1A0
4695
DECK_B_L
PB_LEVEL
DECK_A_L
PB_LEVEL
Recin_L
GND_A
+12
NS
1A0
2A2
DOLBY
TO/FROM SHEET 2
RH
1A1
TO/FROM SHEET 3
3645
68K
3647
3K3
3649
5K6
2635
3n3
3651
1K
LXD-210
5631
RI1
GND
PI1
IREF
MSW
LO1
TC1
RO1
ATT1
ATT2
ATT3
SC
DET
7630
CXA1551
RI2
VCC
PI2
VCT
NSW
LO2
TC2
RO2
B2
TO 2730
2714
Recin_R
2634
220n
3648
3K3
3646
68K
3650
5K6
2636
3n3
3652
100K
LXD-210
5632
B4
TO 3746
2698
100p
3694
10R
4691
2693
100u
2691
2u2
2788
1n
2638
100n
+S
3695
68R
3693
68R
2694
100u
7640-A
NJM4560M
2648
4u7
TO 3718
2718
Pbin_R
3632
47K
3658
1K
2640
100p
2642
4u7
3636
20K
3634
3K3
3642
20K
3640
3K3
2632
47n
2692
100u
3696
10K
6613
BYV10-40
9710
2696
2u2
8
7634
BC847B
3638
100K
7632
BC847B
3644
100K
DECK_B_R
PB_LEVEL
DECK_A_R
PB_LEVEL
10
2646
22p
2644
33n
2654
470p
3666
68K
3664
150K
3662
470K
3668
10R
3660
22K
3684
47K
7638
BC847B
3690
39K
9793
4693
REC-LEVEL-R
3656
4K7
2650
120p
2652
180p
4696
7636
BC847B
3670
4K7

For Provision Only

DOLBY CCTRY

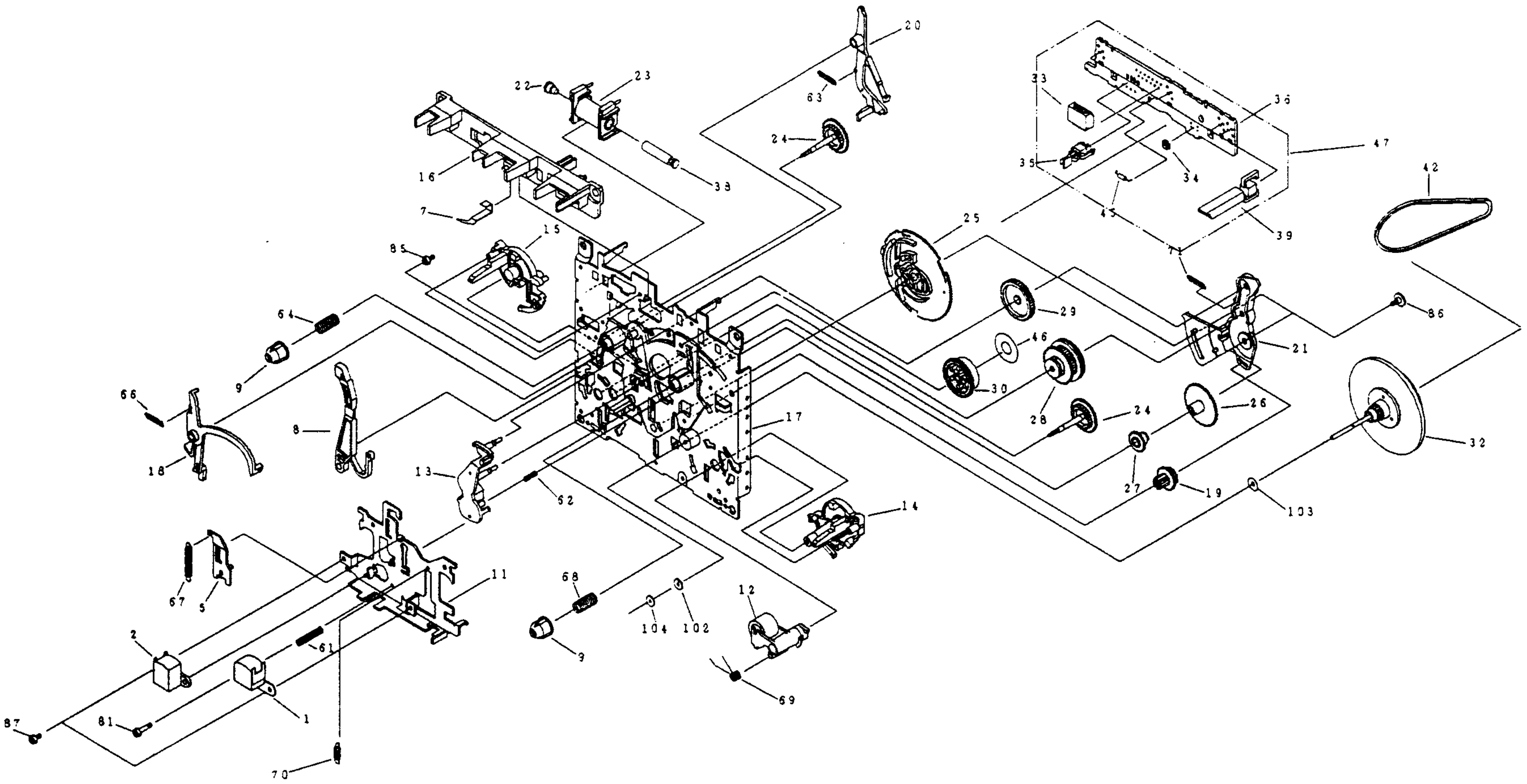
Required For Sets With Dolby B NR Only

- > - Signal path Pb left channel

[illegible]

2631	B6
2632	E6
2633	B3
2634	D3
2635	C5
2636	D5
2637	B8
2638	E8
2639	A4
2640	E2
2641	A4
2642	E3
2643	A4
2644	F2
2645	A3
2646	E2
2647	A3
2648	E1
2649	A2
2650	F2
2651	A2
2652	F2
2653	A5
2654	E3
2691	E7
2692	E7
2693	E6
2694	E1
2695	B7
2696	E7
2697	A3
2698	D3
2699	A5
2788	E7
3631	B4
3632	E4
3633	B5
3634	E5
3635	B4
3636	E4
3637	B4
3638	E4
3639	B6
3640	E6
3641	B5
3642	E5
3643	B5
3644	E5
3645	C3
3646	D3
3647	C4
3648	D4
3649	C5
3650	D5
3651	C5
3652	D5
3655	A8
3656	F8
3657	A5
3658	E3
3659	A5
3660	F4
3661	A4
3662	F3
3663	A4
3664	F2
3665	A3
3666	F2
3667	A5
3668	F3
3669	A2
3670	F3
3683	A6
3684	F4
3689	B7
3690	F7
3691	B7
3692	B7
3693	E3
3694	D6
3695	E2
3696	E6
4691	E6
4693	F7
4694	B6
4695	B6
4696	F2
5631	C4
5632	D4
6613	E7
7630	C6
7631	B5
7632	E5
7633	B4
7634	E4
7635	A2
7636	F2
7637	A5
7638	F3
7640-A	E2
7640-B	A4
9710	E7
9793	F7

TAPE MECHANISM A - PLAY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103
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102
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81
1
70

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10397	MS15RAA2N1
2	4822 249 30146	Dummy Head
12	4822 528 10974	Assembly Arm Pinch R
23	4822 281 11069	Solenoid
32	4822 528 11209	Assembly Flywheel RV
33	4822 265 11207	Connector Socket 6 pin
34	4822 130 10205	Photo Sensor
35	4822 276 13946	Mode Switch
39	4822 276 [illegible]	Leaf Switch
42	4822 358 10168	Belt AF 40mm
45	4822 050 16801	680R 1% 0,4w
69	4822 492 11542	Spring
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer

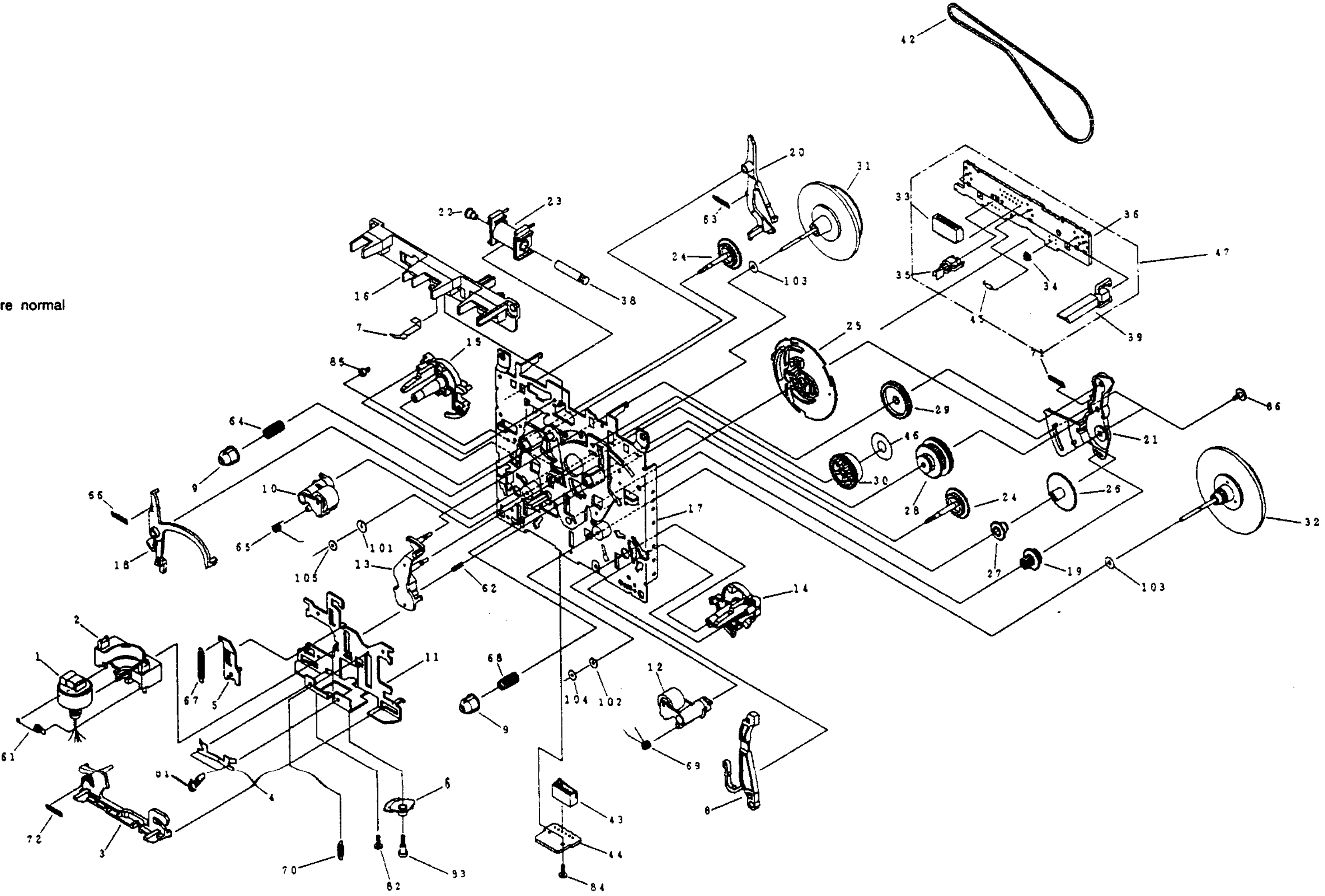
Note: Only the parts mentioned in this list are normal service spare parts.

TAPE MECHANISM B - RECORD/PLAYBACK

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10521	Record/Playback Head
10	4822 528 10975	Assembly Arm Pinch L
12	4822 528 10974	Assembly Arm Pinch R
23	4822 281 11069	Solenoid
31	4822 528 11211	Assembly Flywheel LV
32	4822 528 11209	Assembly Flywheel RV
33	4822 265 11208	Connector Socket 10 pin
34	4822 130 10205	Photo Sensor
35	4822 276 13946	Mode Switch
39	4822 278 90613	Leaf Switch
42	4822 358 10169	Belt
45	4822 050 16801	680R 1% 0,4w
65	4822 492 11546	Spring
69	4822 492 11542	Spring
101	4822 532 12934	Washer
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer
105	4822 532 12935	Washer

Note: Only the parts mentioned in this list are normal service spare parts.


42
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101
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105
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103
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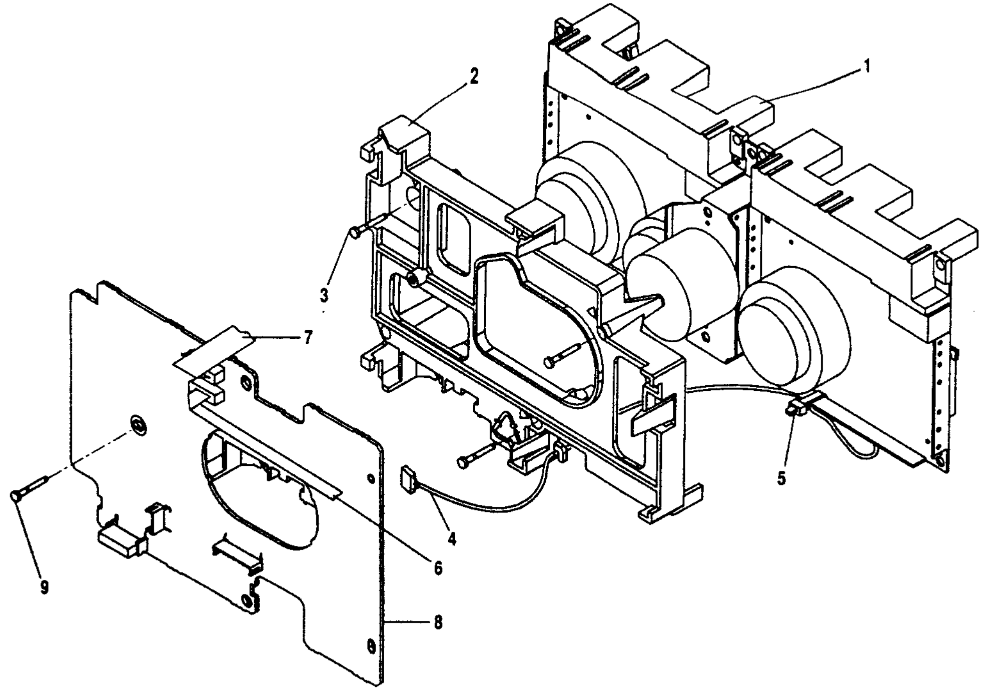


ETF5 TAPE MODULE EXPLODED VIEW

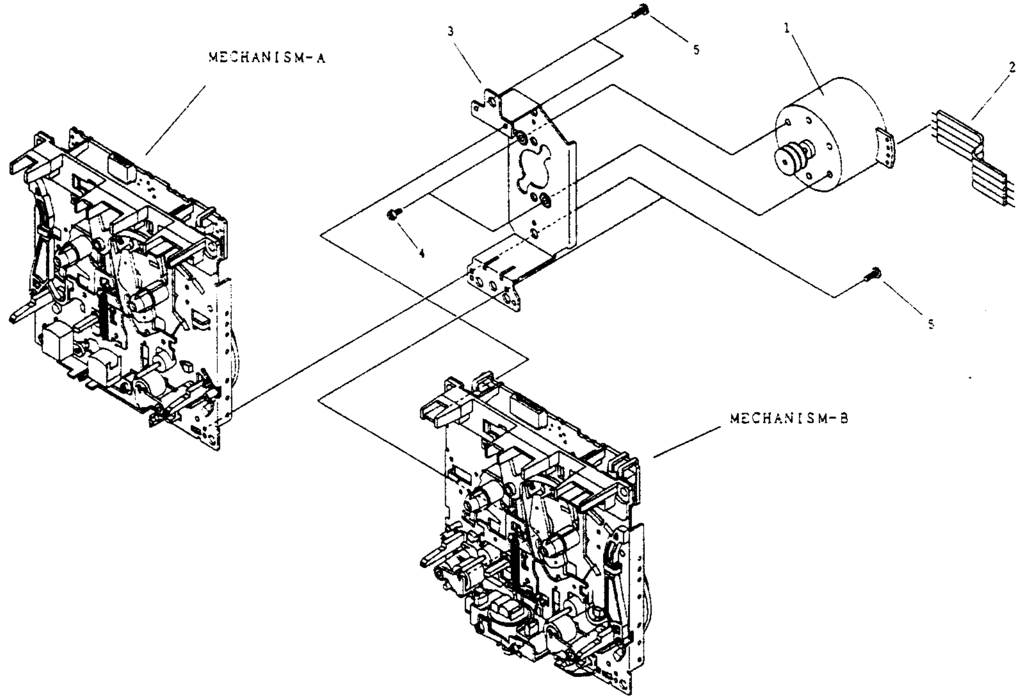
1	4822 691 10671	Tape Mechanism CWB44FR502
3	-	Screw M2 x 16
6	4822 320 12243	Flex Cable 6 pin 18 cm
7	4822 320 12242	Flex Cable 10 pin 7,5 cm
9	-	Screw D3 x 10

Note: Only the parts mentioned in this list are normal service spare parts.

TAPE MECHANISM A & B EXPLODED VIEW

1	4822 361 10841	Motor Assembly
4	-	Screw M2,6 x 4
5	-	Screw M2 x 3

Note: Only the parts mentioned in this list are normal service spare parts.



MISCELLANEOUS

1701	4822 267 10953	Flex Socket 7pin Vert.
1706	4822 267 10953	Flex Socket 7pin Vert.
1740	4822 267 10729	Flex Socket 10pin Vert.
1750	4822 267 10731	Flex Socket 6pin Vert.

CAPACITORS

2621	5322 122 34123	1nF 10% 50V
2622	5322 122 34099	470pF 10% 63V
2623	4822 122 33575	220pF 5% 63V
2624	4822 126 13196	100nF 10% 25V
2625	4822 126 13196	100nF 10% 25V
2631	4822 126 12944	47nF 10% 50V
2632	4822 126 12944	47nF 10% 50V
2633	4822 126 13473	220nF +80/-20% 50V
2634	4822 126 13473	220nF +80/-20% 50V
2635	4822 122 33891	3,3nF 10% 63V
2636	4822 122 33891	3,3nF 10% 63V
2637	5322 121 42386	100nF 5% 63V
2638	5322 121 42386	100nF 5% 63V
2639	5322 122 32531	100pF 5% 50V
2640	5322 122 32531	100pF 5% 50V
2641	4822 124 40769	4,7µF 20% 100V
2642	4822 124 40769	4,7µF 20% 100V
2643	4822 126 12105	33nF 5% 50V
2644	4822 126 12105	33nF 5% 50V
2645	5322 122 32658	22pF 5% 50V
2646	5322 122 32658	22pF 5% 50V
2647	4822 124 40769	4,7µF 20% 100V
2648	4822 124 40769	4,7µF 20% 100V
2649	5322 122 33861	120pF 10% 50V
2650	5322 122 33861	120pF 10% 50V
2651	4822 126 10326	180pF 5% 63V
2652	4822 126 10326	180pF 5% 63V
2653	5322 122 34099	470pF 10% 63V
2654	5322 122 34099	470pF 10% 63V
2692	4822 124 41584	100µF 20% 10V
2693	4822 124 81029	100µF 20% 25V
2694	4822 124 81029	100µF 20% 25V
2695	4822 124 41576	2,2µF 20% 50V
2696	4822 124 41576	2,2µF 20% 50V
2701	4822 122 33805	330pF 10% 63V
2702	4822 122 33805	330pF 10% 63V
2703	5322 122 32531	100pF 5% 50V
2704	5322 122 32531	100pF 5% 50V
2705	5322 122 31863	330pF 5% 63V
2706	5322 122 31863	330pF 5% 63V
2707	5322 122 34099	470pF 10% 63V
2708	5322 122 34099	470pF 10% 63V
2709	5322 122 31863	330pF 5% 63V
2710	5322 122 31863	330pF 5% 63V
2711	5322 122 32531	100pF 5% 50V
2712	5322 122 32531	100pF 5% 50V
2713	4822 124 41579	10µF 20% 50V
2714	4822 124 41579	10µF 20% 50V
2715	4822 124 41584	100µF 20% 10V
2716	4822 124 41584	100µF 20% 10V
2717	4822 122 33175	2,2nF 20% 50V
2718	4822 122 33175	2,2nF 20% 50V
2719	4822 126 13188	15nF 5% 63V
2720	4822 126 13188	15nF 5% 63V
2727	4822 122 32535	680pF 10% 63V
2728	4822 122 32535	680pF 10% 63V
2729	4822 122 32541	27nF 10% 63V
2730	4822 122 32541	27nF 10% 63V
2733	5322 122 34099	470pF 10% 63V
2734	5322 122 34099	470pF 10% 63V
2735	4822 126 13196	100nF 10% 25V
2737	4822 126 13196	100nF 10% 25V
2738	4822 126 13196	100nF 10% 25V
2741	4822 126 11585	22nF +80/-20% 25V
2742	5322 122 32654	22nF 10% 63V
2743	4822 126 13196	100nF 10% 25V
2744	4822 126 13196	100nF 10% 25V
2760	4822 126 13196	100nF 10% 25V
2761	4822 124 22263	220µF 20% 25V
2762	4822 124 40769	4,7µF 20% 100V
2763	4822 124 40433	47µF 20% 25V
2765	4822 124 40433	47µF 20% 25V
2769	5322 122 34099	470pF 10% 63V
2770	5322 122 34099	470pF 10% 63V
2780	4822 124 81151	22µF 50V
2781	4822 122 33177	10nF 20% 50V
2782	5322 126 10223	4,7nF 10% 63V
2784	4822 121 51305	15nF 10% 50V
2785	4822 124 40242	1µF 20% 63V
2786	5322 122 32531	100pF 5% 50V
2787	4822 126 12105	33nF 5% 50V
2788	5322 122 34123	1nF 10% 50V

RESISTORS

3601	4822 117 11449	2k2 1% 0,1W
3602	4822 051 20273	27k 5% 0,1W
3603	4822 117 11449	2k2 1% 0,1W
3604	4822 117 11148	56k 1% 0,1W
3605	4822 117 11449	2k2 1% 0,1W
3606	4822 051 20124	120k 5% 0,1W
3607	4822 116 52256	2k2 5% 0,5W
3608	4822 051 20273	27k 5% 0,1W
3609	4822 116 52256	2k2 5% 0,5W
3610	4822 051 20124	120k 5% 0,1W
3611	4822 116 52256	2k2 5% 0,5W
3612	4822 117 11148	56k 1% 0,1W
3613	4822 051 20273	27k 5% 0,1W
3614	4822 051 20273	27k 5% 0,1W

3616	4822 051 20822	8k2 5% 0,1W
3618	4822 051 20822	8k2 5% 0,1W
3620	5322 100 11542	Trimmer 4k7 30% 0,1W
3622	5322 100 11542	Trimmer 4k7 30% 0,1W
3623	4822 051 20104	100k 5% 0,1W
3624	4822 051 20104	100k 5% 0,1W
3625	4822 051 10102	1k 2% 0,25W
3626	4822 051 10102	1k 2% 0,25W
3628	4822 051 20104	100k 5% 0,1W
3630	4822 051 20471	470R 5% 0,1W
3631	4822 117 10834	47k 1% 0,1W
3632	4822 117 10834	47k 1% 0,1W
3633	4822 051 20332	3k3 5% 0,1W
3634	4822 051 20332	3k3 5% 0,1W
3635	4822 100 11771	Trimmer 20k 30% 0,1W
3636	4822 100 11771	Trimmer 20k 30% 0,1W
3637	4822 051 20104	100k 5% 0,1W
3638	4822 051 20104	100k 5% 0,1W
3639	4822 051 20332	3k3 5% 0,1W
3640	4822 051 20332	3k3 5% 0,1W
3641	4822 100 11771	Trimmer 20k 30% 0,1W
3642	4822 100 11771	Trimmer 20k 30% 0,1W
3643	4822 051 20104	100k 5% 0,1W
3644	4822 051 20104	100k 5% 0,1W
3645	4822 051 20683	68k 5% 0,1W
3646	4822 051 20683	68k 5% 0,1W
3647	4822 051 20332	3k3 5% 0,1W
3648	4822 051 20332	3k3 5% 0,1W
3649	4822 051 20562	5k6 5% 0,1W
3650	4822 051 20562	5k6 5% 0,1W
3651	4822 051 10102	1k 2% 0,25W
3652	4822 050 11002	1k 1% 0,4W
3655	5322 100 11542	Trimmer 4k7 30% 0,1W
3656	5322 100 11542	Trimmer 4k7 30% 0,1W
3657	4822 051 10102	1k 2% 0,25W
3658	4822 051 10102	1k 2% 0,25W
3659	4822 051 20223	22k 5% 0,1W
3660	4822 051 20223	22k 5% 0,1W
3661	4822 051 20474	470k 5% 0,1W
3662	4822 051 20474	470k 5% 0,1W
3663	4822 051 20154	150k 5% 0,1W
3664	4822 051 20154	150k 5% 0,1W
3665	4822 051 20683	68k 5% 0,1W
3666	4822 051 20683	68k 5% 0,1W
3667	4822 051 20109	10R 5% 0,1W
3668	4822 051 20109	10R 5% 0,1W
3669	4822 051 20472	4k7 5% 0,1W
3670	4822 051 20472	4k7 5% 0,1W
3672	4822 051 20472	4k7 5% 0,1W
3674	4822 116 52283	4k7 5% 0,5W
3676	4822 117 10834	47k 1% 0,1W
3678	4822 117 10834	47k 1% 0,1W
3679	4822 117 10834	47k 1% 0,1W
3680	4822 117 10834	47k 1% 0,1W
3683	4822 117 10834	47k 1% 0,1W
3684	4822 117 10834	47k 1% 0,1W
3685	4822 116 52234	100k 5% 0,5W
3686	4822 051 20104	100k 5% 0,1W
3691	4822 117 10833	10k 1% 0,1W
3692	4822 117 10965	18k 1% 0,1W
3693	4822 116 52199	68R 5% 0,5W
3694	4822 052 10109 △	10R 5% 0,33W
3695	4822 117 12521	68R 1% 0,1W
3701	4822 117 11503	220R 1% 0.1W
3702	4822 117 11503	220R 1% 0.1W
3703	4822 117 11503	220R 1% 0.1W
3704	4822 117 11503	220R 1% 0.1W
3705	4822 117 11503	220R 1% 0.1W
3706	4822 117 11503	220R 1% 0.1W
3707	4822 051 20101	100R 5% 0,1W
3708	4822 051 20101	100R 5% 0,1W
3709	4822 051 20229	22R 5% 0,1W
3710	4822 051 20229	22R 5% 0,1W
3711	4822 051 20104	100k 5% 0,1W
3712	4822 051 20104	100k 5% 0,1W
3713	4822 051 20121	120R 5% 0,1W
3714	4822 051 20121	120R 5% 0,1W
3715	4822 051 10102	1k 2% 0,25W
3716	4822 051 10102	1k 2% 0,25W
3717	4822 051 20392	3k9 5% 0,1W
3718	4822 051 20392	3k9 5% 0,1W
3719	4822 051 20822	8k2 5% 0,1W
3720	4822 051 20822	8k2 5% 0,1W
3721	4822 051 20562	5k6 5% 0,1W
3722	4822 051 20562	5k6 5% 0,1W
3723	4822 117 11383	12k 1% 0,1W
3724	4822 117 11383	12k 1% 0,1W
3727	4822 051 20562	5k6 5% 0,1W
3728	4822 051 20562	5k6 5% 0,1W
3729	4822 117 12955	2k7 1% 0,1W
3730	4822 117 12955	2k7 1% 0,1W
3731	4822 051 20562	5k6 5% 0,1W
3732	4822 051 20562	5k6 5% 0,1W
3733	4822 051 20562	5k6 5% 0,1W
3734	4822 051 20562	5k6 5% 0,1W
3735	4822 051 20153	15k 5% 0,1W
3736	4822 051 20153	15k 5% 0,1W
3737	4822 051 20332	3k3 5% 0,1W
3738	4822 051 20332	3k3 5% 0,1W
3739	4822 051 20472	4k7 5% 0,1W
3740	4822 117 10834	47k 1% 0,1W
3741	4822 117 11454	820R 1% 0,1W
3742	4822 117 11454	820R 1% 0,1W
3743	4822 051 20122	1k2 5% 0,1W

RESISTORS

3744	4822 051 20122	1k2 5% 0,1W
3745	4822 051 20392	3k9 5% 0,1W
3746	4822 051 20392	3k9 5% 0,1W
3748	4822 117 11449	2k2 1% 0,1W
3749	4822 117 10834	47k 1% 0,1W
3751	4822 117 10833	10k 1% 0,1W
3752	4822 051 20104	100k 5% 0,1W
3753	4822 051 20104	100k 5% 0,1W
3754	4822 051 20333	33k 5% 0,1W
3756	4822 117 13579	220k 1% 0,1W
3757	4822 117 13579	220k 1% 0,1W
3758	4822 117 10833	10k 1% 0,1W
3759	4822 117 10833	10k 1% 0,1W
3760	4822 051 20121	120R 5% 0,1W
3761	4822 116 83864	10k 5% 0,5W
3762	4822 117 11454	820R 1% 0,1W
3763	4822 051 20154	150k 5% 0,1W
3764	4822 116 83872	220R 5% 0,5W
3765	4822 051 20393	39k 5% 0,1W
3766	4822 051 20475	4M7 5% 0,1W
3767	4822 051 20475	4M7 5% 0,1W
3768	4822 117 10833	10k 1% 0,1W
3769	4822 117 10833	10k 1% 0,1W
3770	4822 117 11139	1k5 1% 0,1W
3771	4822 051 20122	1k2 5% 0,1W
3772	4822 051 20562	5k6 5% 0,1W
3773	5322 100 11542	Trimmer 4k7 30% 0,1W
3774	4822 051 20822	8k2 5% 0,1W
3775	4822 051 20478	4R7 5% 0,1W
3776	4822 117 11507	6k8 1% 0,1W
3777	4822 117 10353	150R 1% 0,1W
3778	4822 052 10688 △	6R8 5% 0,33W
3779	4822 051 20334	330k 5% 0,1W
3780	4822 051 20105	1M 5% 0,1W
3781	4822 051 20475	4M7 5% 0,1W
3782	4822 051 20153	15k 5% 0,1W
3783	4822 051 20472	4k7 5% 0,1W
3784	4822 051 20472	4k7 5% 0,1W
3785	5322 100 11539	Trimmer 100k 30% 0,1W
3786	4822 051 20223	22k 5% 0,1W
3787	4822 051 20105	1M 5% 0,1W
3788	4822 051 20105	1M 5% 0,1W
3789	4822 117 10834	47k 1% 0,1W
4601	4822 051 20008	0R Jumper 0805
4602	4822 051 20008	0R Jumper 0805
4603	4822 051 20008	0R Jumper 0805
4604	4822 051 20008	0R Jumper 0805
4605	4822 051 20008	0R Jumper 0805
4606	4822 051 20008	0R Jumper 0805
4607	4822 051 20008	0R Jumper 0805
4608	4822 051 20008	0R Jumper 0805
4610	4822 051 20008	0R Jumper 0805
4696	4822 051 20008	0R Jumper 0805
4697	4822 051 20008	0R Jumper 0805
4701	4822 051 20008	0R Jumper 0805
4702	4822 051 20008	0R Jumper 0805
4703	4822 051 20008	0R Jumper 0805
4704	4822 051 20008	0R Jumper 0805
4705	4822 051 20008	0R Jumper 0805
4706	4822 051 20008	0R Jumper 0805
4707	4822 051 20008	0R Jumper 0805
4708	4822 051 20008	0R Jumper 0805
4709	4822 051 20008	0R Jumper 0805
4710	4822 051 20008	0R Jumper 0805
4711	4822 051 20008	0R Jumper 0805
4712	4822 051 20008	0R Jumper 0805
4713	4822 051 20008	0R Jumper 0805
4714	4822 051 20008	0R Jumper 0805
4715	4822 051 20008	0R Jumper 0805
4716	4822 051 20008	0R Jumper 0805
4717	4822 051 20008	0R Jumper 0805
4718	4822 051 20008	0R Jumper 0805
4719	4822 051 20008	0R Jumper 0805
4720	4822 051 20008	0R Jumper 0805
4721	4822 051 20008	0R Jumper 0805
4722	4822 051 20008	0R Jumper 0805
4723	4822 051 20008	0R Jumper 0805
4724	4822 051 20008	0R Jumper 0805
4725	4822 051 20008	0R Jumper 0805
4726	4822 051 20008	0R Jumper 0805
4727	4822 051 20008	0R Jumper 0805
4728	4822 051 20008	0R Jumper 0805
4729	4822 051 20008	0R Jumper 0805
4730	4822 051 20008	0R Jumper 0805
4731	4822 051 20008	0R Jumper 0805
4732	4822 051 20008	0R Jumper 0805
4733	4822 051 20008	0R Jumper 0805
4734	4822 051 20008	0R Jumper 0805
4735	4822 051 20008	0R Jumper 0805
4736	4822 051 20008	0R Jumper 0805
4737	4822 051 20008	0R Jumper 0805
4738	4822 051 20008	0R Jumper 0805
4739	4822 051 20008	0R Jumper 0805
4740	4822 051 20008	0R Jumper 0805
4741	4822 051 20008	0R Jumper 0805
4742	4822 051 20008	0R Jumper 0805
4743	4822 051 20008	0R Jumper 0805
4783	4822 051 20008	0R Jumper 0805
4785	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5631	4822 157 11865	MPX Filter 20kHz
5632	4822 157 11865	MPX Filter 20kHz
5701	4822 157 11477	Coil 2,2µH 5%

5702	4822 157 11477	Coil 2,2µH 5%
5703	4822 156 20946	Osc. Coil 100kHz

DIODES

6611	4822 130 31878	1N4003G
6612	4822 130 31878	1N4003G
6613	4822 130 32245	BYV10-40
6614	4822 130 30621	1N4148
6770	4822 130 30621	1N4148
6771	4822 130 30621	1N4148
6772	4822 130 30621	1N4148
6773	4822 130 30621	1N4148
6774	4822 130 30621	1N4148
6775	4822 130 30621	1N4148
6776	4822 130 30621	1N4148
6777	4822 130 34382	BZX79-B8V2
6778	4822 130 30621	1N4148
6782	4822 130 30621	1N4148
6785	4822 130 30621	1N4148
6786	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

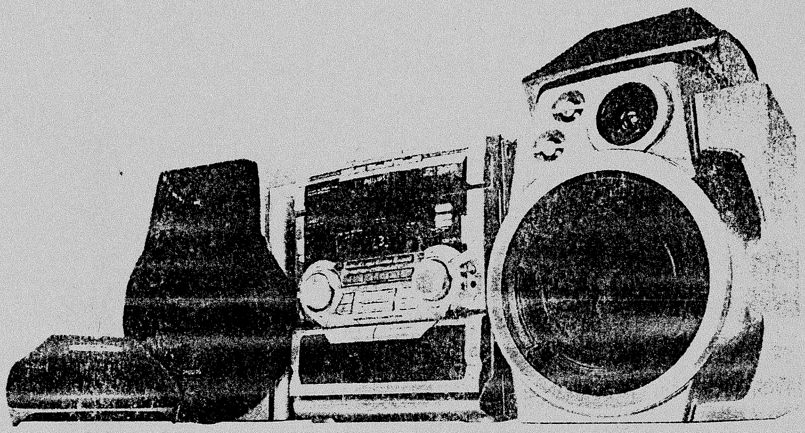
7610	5322 209 11306	HEF4094BT
7612	5322 130 60845	BC807-25
7613	5322 130 60845	BC807-25
7614	5322 130 60845	BC807-25
7616	5322 130 60508	BC857B
7618	4822 130 60511	BC847B
7619	4822 130 60511	BC847B
7620	4822 130 60511	BC847B
7622	4822 130 60511	BC847B
7623	4822 130 60511	BC847B
7624	4822 130 60511	BC847B
7630	4822 209 17322	CXA1551M
7631	4822 130 60511	BC847B
7632	4822 130 60511	BC847B
7633	4822 130 60511	BC847B
7634	4822 130 60511	BC847B
7635	4822 130 60511	BC847B
7636	4822 130 60511	BC847B
7637	4822 130 60511	BC847B
7638	4822 130 60511	BC847B
7640	4822 209 83357	NJM4560M
7710	4822 209 32919	HEF4952BT
7720	4822 209 32918	AN7318S
7730	4822 209 32919	HEF4952BT
7740	4822 209 32919	HEF4952BT
7780	4822 130 60511	BC847B
7781	4822 130 60511	BC847B
7782	4822 130 44568	BC557B
7783	4822 130 60511	BC847B
7784	5322 130 60508	BC857B
7785	4822 130 63494	J111
7786	4822 130 63494	J111
7787	4822 130 60511	BC847B
7788	4822 130 60511	BC847B
7789	4822 130 60511	BC847B
7790	4822 130 60511	BC847B
7791	4822 130 60511	BC847B
7792	4822 130 60511	BC847B

Note: Only the parts mentioned in this list are normal service spare parts.

SERV. 30849

Mini System **FW830C/21/37**

Service
Service
Service



Service Manual

ReWritable CD COMPATIBLE

COMPACT disc DIGITAL AUDIO

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CLASS 1
LASER PRODUCT

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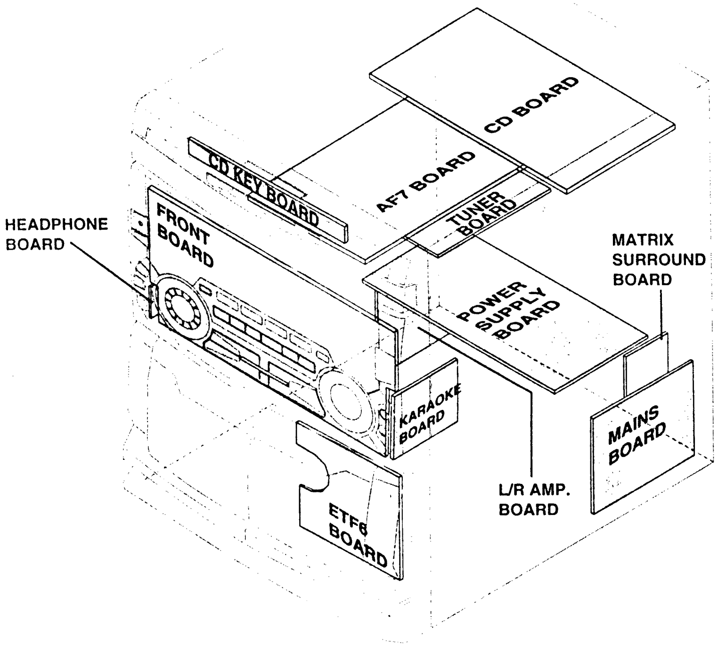
GB 3139 115 50090

PCS 102 706

PHILIPS

LOCATION OF PRINTED CIRCUIT BOARDS



VERSION VARIATIONS:

Type /Versions:	FW830C							
Features & Board in used:	/21	/37						
Aux In	x	x						
Line Out	x	x						
Surround Out								
Subwoofer Out	x	x						
Digital Out	x	x						
Matrix Surround		x						
CD Text								
Dolby B								
RDS								
News								
Dolby Prologic (DPL)								
Karaoke Features	x	x						
Voltage Selector	X							
Low Power Standby / LED		x						
Tuner board - ECO5 Sys	x	x						
Tuner board - Tuner 95								
Surround Loudspeakers		x						

SPECIFICATIONS

GENERAL:

Mains voltage : 100V for /26
110-127V/220-240V Switchable for /21/21M
120V for /37
220V for /33
220-230V for /22/34
230V for /25
230-240V for /30
Mains frequency : 50/60Hz
Power consumption : < 18W at Standby
< 180W at 1/8 rated power out
Clock accuracy : < 4 seconds per day
Dimension centre unit : 265 x 310 x 390mm

TUNER:

FM

Tuning range : 87.5-108MHz
65.81-74MHz for /34
Grid : 50kHz (& 30kHz for /34)
IF frequency : 10.7MHz ± 25kHz
Aerial input : 75ohm coaxial
300ohm click fit for /37
Sensitivity at 26dB S/N : < 7μV
Selectivity at 600kHz bandwidth : > 50dB
Image rejection : > 25dB [> 75dB]
Distortion at RF=1mV, dev. 75kHz : < 3% [< 2%]
-3dB Limiting point : < 7μV
Crosstalk at RF=1mV, dev. 40kHz : > 18dB [> 26dB]

MW

Tuning range : 531-1602kHz
530-1700kHz for /21/21M/37
Grid : 9kHz
10kHz for /21/21M/37
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : < 4.0mV/M
Selectivity at 18kHz bandwidth : > 18dB
IF rejection : > 45dB
Image rejection : > 28dB
Distortion at RF=50mV, m=80% : < 5% [< 7%]

LW

Tuning range : 153-279kHz
Grid : 3kHz
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : [< 7.0mV/M]
Selectivity at 18kHz bandwidth : [> 24dB]
IF rejection : [> 26dB]
Image rejection : [> 35dB]
Distortion at RF=50mV, m=80% : [< 7%]

AMPLIFIER:

Output power (6ohm, 1kHz, 10% THD)
L & R : 2 x 100W
Surround : 2 x 20W

Frequency response within -3dB : 60Hz-16kHz
Dynamic Bass Boost : BEAT, PUNCH, BLAST, DBB OFF [1]
Dynamic Sound Effect (DSE) :SURF, STROBE, PAN, HOLD
Digital Sound Control (DSC) :
Optimal, Classic, Techno, Jazz, Rock, Vocal [1]
Virtual Environmental Control (VEC) :
Hall, Disco, Concert, Club, Cinema, Arcade

Headphone output at 32 ohm : 15mW ± 2dB

Input sensitivity
Aux in : 500mV ± 2dB at 1 kohm
Output sensitivity
Line out : 440mV ± 2dB at 22 kohm
Subwoofer out (max. vol.) : 1.5V ± 2dB at 22 kohm

CASSETTE RECORDER:

Number of track : 2 x 2 stereo
Tape speed : 4.76 cm/sec ±2%
1.6 x 4.76 cm/sec
Wow and flutter : < 0.4% (DIN)
Fast-wind/Rewind time C60 : 130 sec
Bias system : 75kHz ± 10kHz
Rec/Pb freq. response within 8dB: 80Hz - 12.5kHz
Signal to noise ratio (IEC I) : > 44dB
Signal to noise ratio (IEC II) : > 47dB

COMPACT DISC:

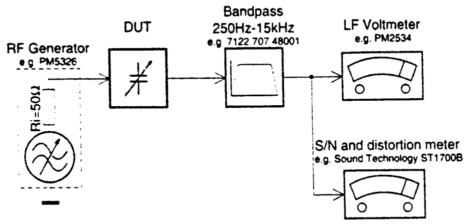
Measurement done at output conn. of the CDC module.
Frequency response within ± 1.5dB : 20Hz - 20kHz
Output level (in Vrms) : 550mV ± 1dB unloaded
Signal/Noise ratio (A-weighted) : > 80dBA
Distortion at 1kHz : < 0.5%
Channel difference at 1kHz : < 1dB
Channel crosstalk at 1kHz : > 60dB
De-emphasis : 0 or 15/50 mS (Switched by subcode on the disc)

[....] Values indicated are for "Tuner 95 Board" only

[1] Frequency response in each setting is software controlled.

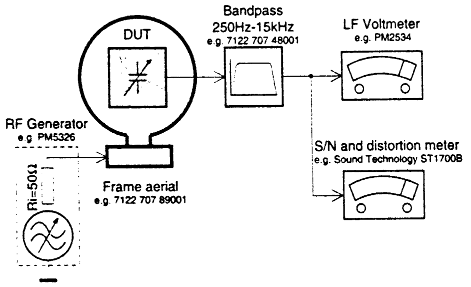
MEASUREMENT SETUP

Tuner FM


DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
S/N and distortion meter
e.g. Sound Technology ST1700B

Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

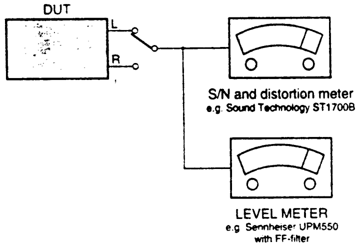
Tuner AM (MW,LW)


DUT
Bandpass
250Hz-15kHz
e.g. 7122 707 48001
LF Voltmeter
e.g. PM2534
RF Generator
e.g. PM5326
Ri=50Ω
Frame aerial
e.g. 7122 707 89001
S/N and distortion meter
e.g. Sound Technology ST1700B

To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday's cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

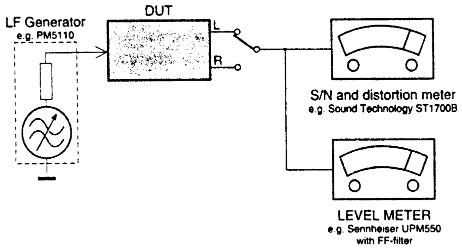
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)


DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071


LF Generator
e.g. PM5110
DUT
L
R
S/N and distortion meter
e.g. Sound Technology ST1700B
LEVEL METER
e.g. Sennheiser UPM550
with FF-filter

SERVICE AIDS

Service Tools:

Universal Torx driver holder	4822 395 91019
Torx bit T10 150mm	4822 395 50456
Torx driver set T6 - T20	4822 395 50145
Torx driver T10 extended	4822 395 50423

Cassette:

SBC419 Test cassette CrO2	4822 397 30069
SBC420 Test cassette Fe	4822 397 30071
MTT150 Dolby level 200nWb/M	4822 397 30271

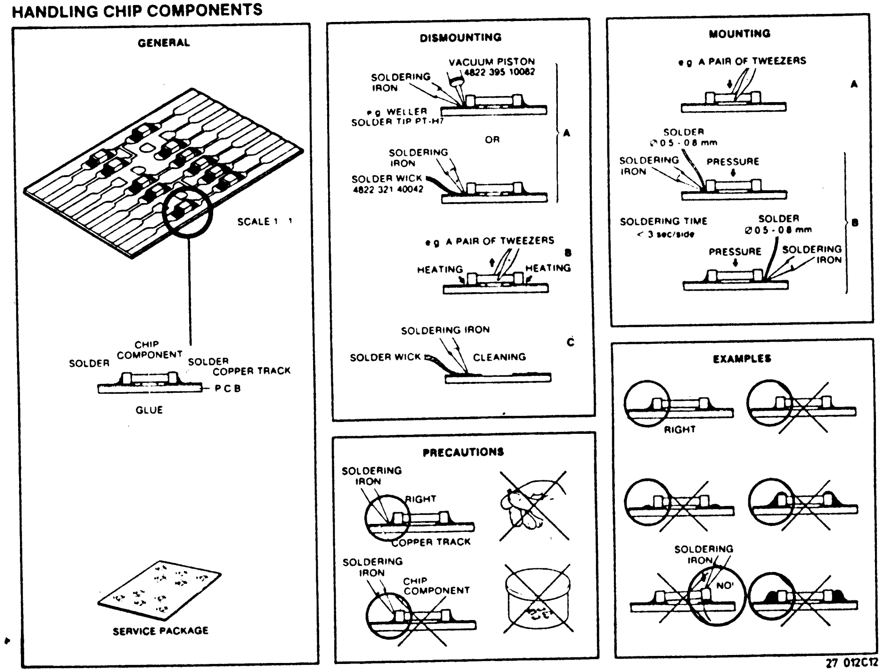
Compact Disc:

SBC426/426A Test disc 5 + 5A	4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz	4822 397 30155
SBC429 Audio Signals disc	4822 397 30184
Dolby Pro-logic Test Disc	4822 395 10216

ESD Equipment:

Anti-static table mat - large 1200x650x1.25mm	4822 466 10953
Anti-static table mat - small 600x650x1.25mm	4822 466 10958
Anti-static wristband	4822 395 10223
Connector box (1MΩ)	4822 320 11307
Extension cable (to connect wristband to conn. box)	4822 320 11305
Connecting cable (to connect table mat to conn. box)	4822 320 11306
Earth cable (to connect product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 320 10671
Wristband tester	4822 344 13999

HANDLING CHIP COMPONENTS


GENERAL
SCALE 1 : 1
CHIP COMPONENT
SOLDER
SOLDER
COPPER TRACK
PCB
GLUE
SERVICE PACKAGE
DISMOUNTING
VACUUM PISTON
4822 395 10082
SOLDERING IRON
e.g. WELLER SOLDER TIP PT-H7
OR
SOLDERING IRON
SOLDER WICK
4822 321 40042
A
e.g. A PAIR OF TWEEZERS
B
HEATING
HEATING
SOLDERING IRON
C
SOLDER WICK
CLEANING
MOUNTING
e.g. A PAIR OF TWEEZERS
A
SOLDER
Ø0.5 - 0.8 mm
SOLDERING IRON
PRESSURE
SOLDERING TIME
< 3 sec/side
SOLDER
Ø0.5 - 0.8 mm
PRESSURE
SOLDERING IRON
B
PRECAUTIONS
SOLDERING IRON
RIGHT
COPPER TRACK
SOLDERING IRON
CHIP COMPONENT
EXAMPLES
RIGHT
SOLDERING IRON
NO!
27 012C12

ESD

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux decharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au meme potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de securité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

(GB)

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

(NL)

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

(F)

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques a celles spécifiées.

(D)

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

(I)

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à reparer votre appareil en panne".

CLASS 1
LASER PRODUCT
3122 110 03420

(GB) Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

(S) Varning !

Osynlig laserstrålning når apparaten år öppnad och spärren år urkopplad. Betrakta ej strålen.

(SF) Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

(DK) Advarse !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

IMPORTANT:
PLEASE NOTE THAT THE VOLTAGE SELECTOR LOCATED AT THE REAR OF THIS SYSTEM IS PRESET AT 220V FROM THE FACTORY. FOR COUNTRIES THAT OPERATE AT 110V, PLEASE ADJUST TO 110V BEFORE YOU SWITCH ON THE SYSTEM.

General Information

- ***The typeplate (which contains the serial number) is located at the rear of the system.***
- ***Recording is permissible if copyright or other rights of third parties are not infringed.***
- ***This product complies with the radio interference requirements of the European Community.***

Environmental Information

All unnecessary packaging has been omitted. We have tried to make the packaging easy to separate into three materials. cardboard (box), polystyrene foam (buffer) and polyethylene (bags, protective foam sheet).

Your system consists of materials which can be recycled and reused if disassembled by a specialized company. Please observe the local regulations regarding the disposal of packaging materials, exhausted batteries and old equipment.

Accessories *(Supplied)*

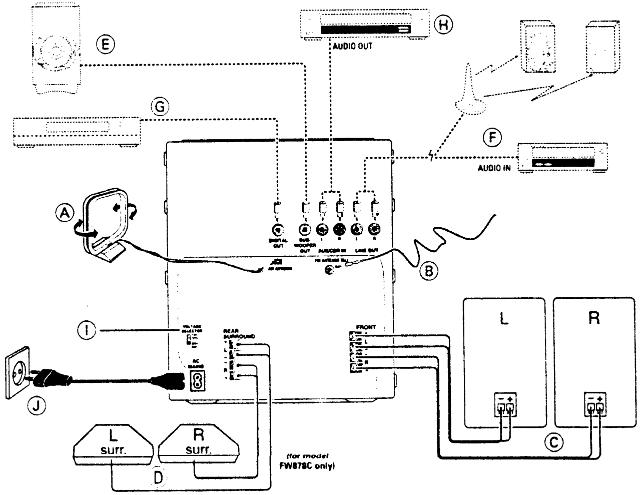
- Remote control
- Batteries (two AA size) for remote control
- AM loop antenna
- FM wire antenna
- AC power cord
- SS30 surround speakers *(for model FW678C only)*

Safety Information

- Before operating the system, check that the operating voltage indicated on the typeplate (or the voltage indication beside the voltage selector) of your system is identical with the voltage of your local power supply. If not, please consult your dealer. The typeplate is located at the rear of your system.
- When the system is switched on, do not move it around.
- Place the system on a solid base (e.g. a cabinet).
- Place the system in a location with adequate ventilation to prevent internal heat build-up in your system.
- The system incorporates a built-in safety feature that prevents over heating.
- Do not expose the system to excessive moisture, rain, sand or heat sources.
- Under no circumstances should you repair the system yourself, as this will invalidate the warranty!
- If the system is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens of the CD unit inside the system. Should this occur, the CD player will not operate normally. Leave the power on for about one hour with no disc in the system until normal playback is possible.
- Electrostatic discharge may cause unexpected problems. See whether these problems disappear if you unplug the AC power cord and plug it in again after a few seconds.
- **To disconnect the system from the power supply completely, remove the AC power plug from the wall socket.**

PREPARATION

Rear Connections



(for model FW878C only)

PREPARATION

Ⓐ AM Loop Antenna Connection

Connect the supplied loop antenna to the AM ANTENNA terminal. Place the AM loop antenna far away from the system and adjust its position for the best reception.

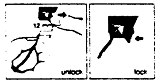
Ⓑ FM Wire Antenna Connection

Connect the supplied FM wire antenna to the FM ANTENNA 75 Ω terminal. Adjust the position of the FM antenna for the best reception.

Outdoor Antenna
For better FM stereo reception connect an outdoor FM antenna to the FM ANTENNA 75 Ω terminal using a 75 Ω coaxial wire.

Ⓒ Speakers Connection

- Connect the right speaker to Front terminal R, with the red wire to + and the black wire to –.
- Connect the left speaker to Front terminal L, with the red wire to + and the black wire to –.
- Clip the stripped portion of the speaker wire as shown.



Ⓓ Rear Speakers' Connection

(for model FW678C only)

Connect the black (non-marked) wires to the black REAR SURROUND terminals and the white (marked wires) to the grey REAR SURROUND terminals.

Ⓔ Subwoofer Out Connection

Connect the optional active subwoofer to the SUBWOOFER OUT terminal. The subwoofer reproduces just the low bass effect (e.g. explosions, the rumble of spaceships, etc.). Be sure to follow the instructions supplied with the subwoofer.

Ⓕ Line Out Connection *(wireless ready)*

You can connect the audio left and right LINE OUT terminals to a optional CD Recorder ANALOGUE IN terminals. This allows you to record in an analogue format.

You can also install additional optional front active speakers away from the system (e.g. in another room) to reduce the inconvenience of running long speaker wires across rooms. You can place as many remote speakers as you like provided they operate at the same radio frequency. Connect the wireless radio frequency transmitter to the LINE OUT terminals. Place the active speakers at your preferred location. Be sure to follow the instructions supplied with the active speakers.

Note:
- *Availability of a wireless transmitter and its peripherals is subjected to the approval of local authorities. Please check with your local safety or approving authority.*

Ⓖ Digital Out Connection

You can record the digital sound from the CD, through this output, on any audio equipment with digital input (e.g. CD Recorder, Digital Audio Tape (DAT) deck, Digital to Analog Converter and Digital Signal Processor).

Connect one end of the cinch cable (not supplied) to the DIGITAL OUT socket and the other end to the audio equipment with digital input. When connecting the cinch cable, make sure it is fully inserted.

Ⓗ Connecting other equipment to your system

You can connect the audio left and right OUT terminals of a TV, VCR, Laser Disc player, DVD player or CD-Recorder to the AUX/CDR IN terminals at the rear of the system.

Ⓘ Adjusting the Operating Voltage *(not available for all versions)*

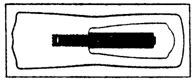
Before connecting the AC power cord to a wall outlet, make sure that the voltage selector at the rear of the system is set to the local power line voltage. If not, reset the selector before connecting to the wall outlet.

Ⓙ AC Power Supply

After all other connections have been made, connect the AC power cord to the system and to the wall outlet.

Inserting batteries into the Remote Control

- Insert the batteries (Type R06 or AA) into the remote control as shown in the battery compartment.



- To avoid damage from possible battery leakage, remove dead batteries or batteries that will not be used for a long time. For replacement, use type R06 or AA batteries.

CONTROLS

Controls on the system and remote control

1 **STANDBY ON**
- to switch the system on or to standby mode.
- to use for EASY SET.

2 **JOG**
- to select the desired equalizer display.
- to select the desired DSC setting. You must select the DSC feature first
- to select the desired level of Personal Sound. You must select the PERSONAL Sound setting first.
- to select the desired VEC setting. You must select the VEC feature first.

3 🎧
- to connect headphones.

4 **REC (RECORD)**
- to start recording on tape deck 2.

5 **DUB (HIGH SPEED DUBBING [HSD])**
- to dub a tape in normal or fast speed.

6 **MORE**
- to switch the calibration status on or off.
- to select personal equalizer band for adjustment.
- to select personal equalizer setting for storing

7 **ENTER**
- to confirm the calibration status.
- to store the personal equalizer band.
- to store and confirm the personal equalizer setting.

8 **CLOCK/TIMER**
- to view the clock, set the clock or set the timer.

9 **PROG (PROGRAM)**
- to program CD tracks in CD mode or preset radio stations in tuner mode.

10 **DISPLAY**
- to view the current setting of the system.

11 **CD CAROUSEL TRAY**

12 **CD DIRECT PLAY (DISC 1 / DISC 2 / DISC 3)**
- to select a CD tray for playback.

13 **DISC CHANGE**
- to change CD(s).

14 **OPEN•CLOSE**
- to open or close the CD carousel.

15 **SOURCE** : to select the following

CD / (CD 1•2•3)
- to select CD mode. When CD playback is stopped, press to select the disc tray 1, 2 or 3.

TUNER / (BAND)
- to select Tuner mode. When in Tuner mode, press to select the waveband FM or MW.

TAPE / (TAPE 1• 2)
- to select Tape mode. When tape playback is stopped, press to select either tape deck 1 or 2.

AUX / (CDR)
- to select sound from an external source (e.g. TV, VCR, Laser Disc player, DVD player or CD Recorder). When in Aux mode, press to select either AUX or CDR.

16 **SOUND DISPLAY PANEL**
- to view the selected Interactive Sound Studio setting

17 **MODE SELECTION**

◀◀ ▶▶ (SEARCH •TUNING)
for CD .... to search backward/ forward.
for TUNER ..... to tune to a lower or higher radio frequency.
for TAPE .... to rewind or fast forward a tape on tape deck 2 only

■ (STOP•CLEAR)
for CD .... to stop CD playback or to clear a program
for TUNER .... to stop programming
for TAPE .... to stop playback or recording
DEMO .... *(on the system only)* to start or stop demonstration mode

▶ II (PLAY •SIDE)
for CD .... to start or interrupt playback
for TAPE .... to start playback
.... SIDE : When playing in Tape 2 mode, to change side

I◀ ▶I (PRESET ▼▲)
for CD .... to skip to the beginning of the current, previous, or next track
for TUNER .... to select a preset radio station in memory.

18 **A. REV (AUTO REVERSE)**
- available in tape deck 2 only.
- to select the desired play modes (⊐ / ⊐⊃ / (⊐⊃)).

19 **MAX SOUND**
- to switch on or off MAX sound for extra bass.

20 **MIC LEVEL**
- to adjust the mixing level for karaoke or microphone recording.

21 **MIC**
- to connect microphone jack.

22 **VOLUME**
- to adjust the volume.

23 **OPEN**
- to open tape deck 2

24 **TAPE DECK 2**

25 **INTERACTIVE SOUND STUDIO**

DIGITAL SOUND CONTROL (DSC)
- to select the desired sound effect : OPTIMAL, TECHNO, ROCK, CLASSIC, VOCAL or JAZZ.

PERSONAL
- to select or set personal equalizer setting

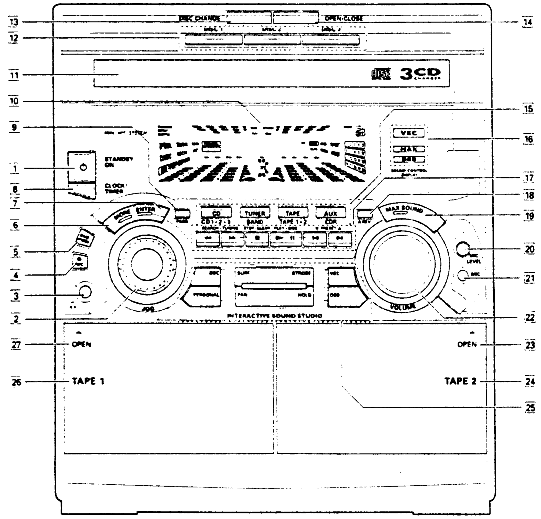
SURF
- to switch on or off the SURF feature

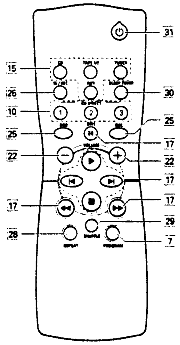
STROBE
- to switch on or off the STROBE feature.

PAN
- to switch on or off the PAN feature.

HOLD
- to switch on or off the HOLD feature during CD playback only.

CONTROLS





VEC
- to select the desired sound effect : HALL, DISCO, CONCERT, CLUB, CINEMA or ARCADE.

DYNAMIC BASS BOOST (DBB)
- to select a bass boost level or to switch off bass boost.

26 **TAPE DECK 1**

27 **OPEN**
- to open tape deck 1.

28 **REPEAT**
- to repeat a CD track, a disc, or all the available discs.

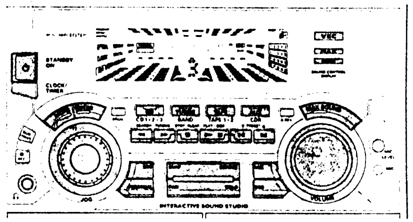
29 **SHUFFLE**
- to play all the available discs and their tracks in random order.

30 **SLEEP TIMER**
- to switch the system to standby mode at a selected time period.

31 ⏻
- to switch the system to standby mode.

Notes for remote control:
- ***First select the source you wish to control by pressing one of the source select keys on the remote control (e.g. CD, TUNER, TAPE 1/2 or AUX).***
- ***Then select the desired function (▶, I◀, ▶I, etc.).***

OPERATING THE SYSTEM



Important:
Before you operate the system, complete the preparation procedures.

Demonstration mode

The system has a demonstration mode that shows the various features offered by the system. ***When the system is switched on for the first time, the demonstration mode will start automatically.***

Notes:
- *During the demonstration, if you press any source (or standby-on) button, the system will switch to the respective mode (or standby).*
- *When the system is switched to standby mode, the demonstration will resume 5 seconds later.*

To stop the demonstration mode
- Press and hold ■ *(on the system only)* for ***5 seconds*** when the system is in demonstration mode.
  → The demonstration will stop.
  → "DEMO OFF" is displayed.
  → The system will switch to standby mode.

Note:
- *Even though the AC power cord is removed from and reconnected to the wall socket, the demonstration will remain off until it is switched on again.*

To start the demonstration mode
- Press and hold ■ *(on the system only)* for ***5 seconds*** when the system is in standby mode.
  → The demonstration will begin.

Easy Set

EASY SET allows you to store all available radio stations automatically

1 Press and hold **STANDBY ON** *(on the system only)* for ***5 seconds***, when the system is in standby or demonstration mode.
   → "EASY SET" will be displayed, and followed by "TUNER" and then "AUTO"
   → EASY SET will start searching for all radio on FM band and then followed by radio stations on MW band.
   → All available radio stations with sufficient signal strength will be stored. Up to 40 presets may be stored.

Notes
- *EASY SET will start with the FM band, if there are still presets available, the system will continue to store the MW band*
- *When EASY SET is used, all previously stored radio stations will be replaced.*
- *The last preset radio station will appear on the display when EASY SET is completed*

Switching the system ON

- Press **CD**, **TUNER**, **TAPE** or **AUX**.

You can also switch on the system by pressing any one of the CD DIRECT PLAY buttons.

Switching the system to standby mode

- Press **STANDBY•ON** again or ⏻ on the remote control
  → The system will switch to standby mode.

Selecting the Source

- Press the respective source selection button: **CD**, **TUNER**, **TAPE** or **AUX**.
  → The display indicates the selected source

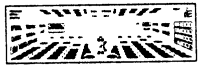
Note:
- *For an external source, make sure you have connected the audio left and right OUT terminals of the external equipment (TV, VCR, Laser Disc player, DVD player or CD Recorder) to the AUX/CDR IN terminals*

Selecting the Equalizer Display

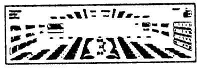
You can select the desired equalizer display for the system. You must not press the DSC button on the system before using the JOG.

- Rotate the **JOG** to select the desired Equalizer Display, PEAK HOLD, MIDDLE OUT, TOP DOWN, NORMAL, or NITE MODE.
  → The selected display will be shown.

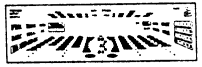
PEAK HOLD Display



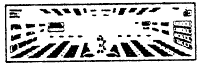
MIDDLE OUT Display



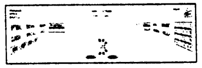
TOP DOWN Display



NORMAL Display



NITE MODE Display



Note:
- *In NITE MODE, all lights will be switched off and the display brightness will be dimmed.*

Sound Control

VOLUME ADJUSTMENT

Adjust **VOLUME** to increase or decrease the sound level.

For Personal Listening

Connect the headphones plug to the 🎧 socket at the front of the system. The speakers will be muted.

AUTO DIGITAL SOUND CONTROL (DSC)

- Press and hold **DIGITAL SOUND CONTROL (DSC)** for about 5 seconds.
  → The current music is sampled and it automatically select the most suitable DSC setting.

PAN

This feature allows you to simulate a panoramic sound effect as though the music is circling through the room.

- Press **PAN**
  → "PAN XX" will be displayed.

HOLD

This feature allows you to simulate the sound effect like scratching a vinyl LP record and is only applicable during CD play mode.

- Press **HOLD**.
  → "HOLD XX" will be displayed.

Notes:
- *"XX" is the speed of the effect.*
- *All other sound effects will be switched off when SURF, STROBE, PAN or HOLD is selected.*

DYNAMIC BASS BOOST (DBB)

There are three DBB settings to enhance the bass response.

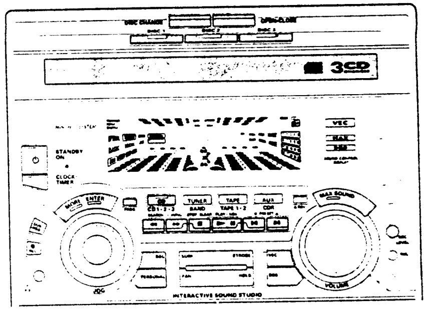
- Press **DBB** briefly to select a bass boost level.
  → The respective DBB level is being encircled and lit.
  → "BEAT, PUNCH or BLAST" will be displayed.

To switch off DBB
- Press **DBB** briefly until "DBB OFF" is displayed.

Note:
- *Some CDs or tapes might be recorded in high modulation. It may cause distortion at high volume. If this occurs, switch off DBB or reduce the volume.*

Automatic DSC-DBB selection

The best DBB setting is generated automatically for each DSC selection. You can manually select the DBB setting that best suits your listening environment.



Warning!
1) ***This system is designed for conventional CDs. Do not use any accessories such as disc stabilizer rings or CD treatment sheets, etc., which may damage the CD mechanism.***
2) ***Do not load more than one disc into each tray.***
3) ***When the CD changer is loaded with CDs, do not turn over or shake the system. This may jam the changer.***

You may load three discs in the CD changer for continuous playback without interruption.

Disc for playback

This system can playback all audio CD, finalized audio CD-Recordable and finalized audio CD-Rewritable format discs.

DIGITAL SOUND CONTROL (DSC)

The DSC feature enables you to adjust the system to suit your type of music.

- Press **DIGITAL SOUND CONTROL (DSC)** to select OPTIMAL, TECHNO, ROCK, CLASSIC, VOCAL or JAZZ.
  → The selected digital sound is encircled.
  → "OPTIMAL X, TECHNO X, ROCK X, CLASSIC, VOCAL X or JAZZ X" will be displayed. "X" is the pre-selected level.
  → VEC will be switched off

You can change the digital sound setting level for all except CLASSIC with the JOG.

- First select the DSC feature, then rotate the **JOG** until the desired digital sound setting level is reached.
  → The digital sound setting level will increase or decrease between level 1 and 5.

Note:
- *For neutral setting, select CLASSIC and switch off DBB*

VIRTUAL ENVIRONMENT CONTROL (VEC)

The VEC feature enables you to adjust the system to select a type of environment.

- Press **VEC** to select HALL, DISCO, CONCERT, CLUB, CINEMA or ARCADE.
  → The selected environment is encircled
  → "HALL X, DISCO X, CONCERT, CLUB X, CINEMA X or ARCADE X" will be displayed. "X" is the pre-selected level.

You can change the environment setting level for all except CONCERT with the JOG.

- First select the VEC feature, then rotate the **JOG** until the desired environment is reached.
  → The level will increase or decrease between level 1 and 5.

AUTO SOUND CALIBRATION (ASC)

Whenever a new DSC or VEC feature is selected. The ASC will automatically calibrate the new sound inorder to give a smooth transition.

1 Press **DSC** or **VEC**
   → The selected digital sound is encircled.
2 Press **MORE** to switch the calibration ON or OFF
3 Press **ENTER** to confirm the selection
   → "CALIBRATION ON" or "CALIBRATION OFF" will be displayed.

MAX SOUND

The MAX SOUND feature enables you to unleash a maximum sound effect combining the volume and DBB effect.

- Press **MAX SOUND** to switch on or off.
  → "MAX SOUND" or "OFF" will be displayed.

PERSONAL SOUND

You can store upto 6 personal settings.
- Press **PERSONAL** to select USER 1, USER 2, USER 3, USER 4, USER 5 or USER 6
  → "USER 1, USER 2, USER 3, USER 4, USER 5 or USER 6." will be displayed.

Personal Setting

You can adjust the personal setting to your desired level with the JOG.

1 Press and hold **PERSONAL** for about 5 seconds.
   → The personal setting mode is switched on.
   → "60 HZ" will be displayed.
2 Rotate the **JOG** until the desired equalizer band level.
   → The equalizer band level will be displayed
3 Press **MORE** to select the next equalizer band
   60 HZ → 250 HZ → 1 KHZ → 4 KHZ → 16 KHZ → 60 HZ ...

- Repeat ***2*** and ***3*** until all equalizer bands are set.

4 Press **ENTER** to confirm the personal setting.
   → "STORE UX" will be displayed. "X" is the next available personal setting.
- Press **MORE** to select the desired store location.
5 Press **ENTER** to confirm the store location.

- ***Repeat 1 – 5 to adjust the other personal settings.***

Rotate the JOG to adjust the speed of the effect after selecting SURF, STROBE, PAN or HOLD.

SURF

This feature allows you to simulate the sound effect like an ocean wave as though the music is surfing on top of the waves.

- Press **SURF**.
  → "SURF XX" will be displayed.

STROBE

This feature allows you to simulate a stroboscopic sound effect as though the music appears and disappears.

- Press **STROBE**.
  → "STRB XX" will be displayed.

Loading the CD Changer

1 Press **CD** to select CD mode.
2 Press **OPEN•CLOSE**.
   → The CD carousel slides out.
3 Load a CD with the printed side up in the right tray.
- You can load another disc in the left tray.
- To load the third disc, press the **DISC CHANGE** button.
  → The CD carousel will rotate until the empty tray is ready for loading.

4 Press **OPEN•CLOSE** to close the CD carousel.
   → The total number of tracks and the playing time of the last selected disc appear on the display.

Note:
- *To ensure good system performance, wait until the CD changer completely reads the disc(s) before proceeding.*

CD Direct Play

You can play a CD directly by pressing the **DISC 1**, **DISC 2** or **DISC 3** button. The CD player will stop at the end of playback of the selected disc.

- A lit button indicates that a disc is loaded in the disc tray.

Playing a CD

1 Press ▶ to start playback.
   → The disc tray, track number and elapsed playing time of the current track appear on the display.
- To interrupt playback, press ❚❚.
  → The playing time flashes.
- To resume playback, press ▶ again.

2 To stop playback, press ■.

Note:
- *All the available discs will play once, then stop.*

Disc Change

You can change the outer two discs while the third inner disc is stopped or is playing.

1 Press **DISC CHANGE**.
   → The CD carousel slides out.
2 Replace the discs in the left and right disc trays.
- If you press **DISC CHANGE** again during playback, the CD will stop playing.
  → The CD carousel will rotate until the inner tray is rotated out and is ready for loading.

3 Press **OPEN•CLOSE** to close the CD compartment.

Selecting a desired track

Selecting a desired track when playback is stopped

1 Press ⏮ or ⏭ until the desired track appears on the display.
2 Press ▶ to start playback.
   → The selected track number and elapsed playing time appear on the display.

Selecting a desired track during playback

- Press ⏮ or ⏭ until the desired track appears on the display.
  → The selected track number and elapsed playing time appear on the display.
- If you press ⏮ once it will skip to the beginning of the current track and play the track again.

Searching for a particular passage during playback

- Press and hold ◀◀ or ▶▶ until the desired passage is located.
  → The volume will be reduced.
- Play returns to normal when ◀◀ or ▶▶ is released.

Programming Tracks

Programming tracks of a loaded CD is possible when playback is stopped. The display will indicate the total tracks stored in the program. Up to 40 tracks can be stored in the memory in any order. When 40 tracks are stored and you attempt to store another track, the display will show "FULL".

1 Load the desired discs in the disc trays.
2 Press **PROGRAM** to start programming.
   → The PROGRAM flag starts flashing.
   → It will cancel any previously selected repeat mode.
3 Press the **CD** (CD 1•2•3) button to select the disc.
4 Press ⏮ or ⏭ to select the desired track.
5 Press **PROGRAM** to store the track.
- Repeat steps ***3*** to ***5*** to store other discs and tracks.

6 Press ■ once to end programming.
   → The total number of tracks programmed and total playing time appear on the display.

Notes:
- *If the total playing time is more than "99:59" or if one of the programmed tracks has a number greater than 30, then "- - : - -" appears on the display instead of the total playing time.*
- *During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.*

Reviewing the program

Reviewing of the program is possible only when playback is stopped

- Press ⏮ or ⏭ repeatedly to review the programmed tracks.
- Press ■ to exit review mode.

Playing the program

1 Press ▶ to start program playback.
  → "PLAY PROGRAM" appears on the display.
  → The track number and elapsed playing time of the current track will appear on the display.
- If you press **REPEAT** during program playback, the current track or all programmed tracks will be played repeatedly.
  → The **REPEAT** and **PROGRAM** flags will be displayed.

2 Press ■ to stop program playback.

Notes:
- *If you press any of the CD DIRECT PLAY buttons, the system will play the selected disc or track and the stored program will be ignored temporarily. The PROGRAM flag also will disappear temporarily from the display. It will reappear when playback of the selected disc ends.*
- *REPEAT DISC mode will be cancelled when program playback begins.*

Erasing the program *(when playback is stopped)*

- Press ■.
  → "PROGRAM CLEARED" will be displayed.

Note:
- *The program will be erased when the system is disconnected from the power supply or when the CD carousel is opened. If the CD carousel is opened, the tracks belonging to the outer two trays will be erased and the display will show "TRACKS CLEARED".*

Shuffle *(only on remote control)*

In shuffle mode, the system plays all the available discs and their tracks in random order. Shuffle may be used also when tracks are programmed.

To shuffle all the discs and tracks

1 Press **SHUFFLE**
  → "SHUFFLE" will be displayed.
  → The **SHUFFLE** flag, the disc and the track selected at random appear on the display.
- The discs and the tracks will be played in random order until you press ■.
- If you press **REPEAT** during shuffling, the current track or all available discs will be played repeatedly.
  → "TRACK" or "ALL" will be displayed.
  → The **REPEAT** and **SHUFFLE** flags will be displayed.

2 Press **SHUFFLE** again to resume normal playback.
  → The **SHUFFLE** flag disappears from the display.

Note:
- *REPEAT DISC mode will be cancelled when shuffle is selected.*

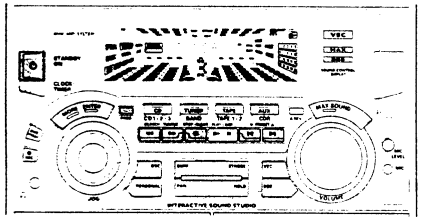
Repeat *(only on remote control)*

You can play the current track, a disc or all available discs repeatedly.

1 Press **REPEAT** on the remote control during CD playback to select the various repeat modes.
  → "TRACK", "DISC", "ALL" or "OFF" will be displayed.
  → The **REPEAT** flag appears on the display.
- The selected track, selected disc or all available discs will now be played repeatedly until you press ■.

2 Press **REPEAT** until the "OFF" mode is displayed to resume normal playback.
  → The **REPEAT** flag disappears from the display.

Notes:
- *REPEAT DISC mode is not available during program play or shuffling mode.*
- *You can also repeat shuffling a program.*
  → "REPEAT TRACK" or "REPEAT PROGRAM" will be displayed.
  *→ The **REPEAT**, **PROGRAM** and **SHUFFLE** flags appear on the display.*



Note:
- *For 'EASY SET' feature, please refer to page 11.*

Tuning to radio stations

1 Press **TUNER** (BAND) to select TUNER mode
  → "TUNER" will be displayed.
  A few seconds later, the current radio frequency will be displayed.

2 Press **TUNER** (BAND) again to select the desired waveband FM or MW.

3 Press **TUNING** ◀◀ or ▶▶ for more than one second, then release.
  → The display will show "SEARCH" until a radio station with sufficient signal strength is found.
- Repeat this procedure until the desired station is reached.
- To tune to a weak radio station, briefly press **TUNING** ◀◀ or ▶▶ repeatedly until the display shows the desired frequency and/or when the best reception has been obtained.

Storing Preset Stations

You can store up to 40 radio stations in the memory. When a preset radio station is selected, the preset number appears next to the frequency on the display.

Automatic programming

1 Press **TUNER** (BAND)

2 Press **PROGRAM** for more than one second.
  → The **PROGRAM** flag starts flashing and "AUTO" will be displayed.
  → The system will search for every available station in the FM waveband first, then search the MW wavebands.
  → All available radio stations will be stored automatically. The frequency and preset number will be displayed briefly.
  → The system will stop searching when all the available radio stations are stored or when the memory for 40 preset radio stations is used.
  → The system will remain tuned to the last stored preset radio station.

Notes:
- *You can cancel the automatic programming by pressing PROGRAM or ■ (on the system only).*
- *If you want to reserve a section of preset numbers, for example preset numbers 1 to 9, select preset 10 before starting automatic programming: only the preset numbers 10 to 40 will be programmed.*

Manual programming

1 Press **TUNER** (BAND).

2 Press **TUNER** (BAND) again to select the desired waveband : FM or MW.

3 Press **PROGRAM** for less than one second.
  → The **PROGRAM** flag starts flashing.
  → The next available preset number will be displayed for selection.

4 Press **TUNING** ◀◀ or ▶▶ to tune to the desired frequency.
- If you wish to store the radio station to another preset number, press **PRESET** ▼ or ▲ to select the desired preset number.

5 Press **PROGRAM** again.
  → The **PROGRAM** flag disappears and the radio station will be stored.
- Repeat the ***steps 3 to 5*** to store other preset radio stations.

Notes:
- *When 40 radio stations are stored and you attempt to store another radio station, the display will show " FULL ". If you want to change an existing preset number, repeat steps 3 and 5.*
- *You can cancel manual programming by pressing ■ (on the system only).*
- *During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.*

Tuning to Preset Radio Stations

- Press **PRESET** ▼ or ▲ to select the desired preset number.
  → The preset number, radio frequency, and waveband appear on the display.

Changing the MW tuning grid

(not available for version /30)

The frequency step can be changed if necessary. In North and South America, the frequency step between adjacent channels in the MW band is 10 kHz. In other parts of the world, it is 9 kHz. The frequency step presetted in the factory is 9 kHz.

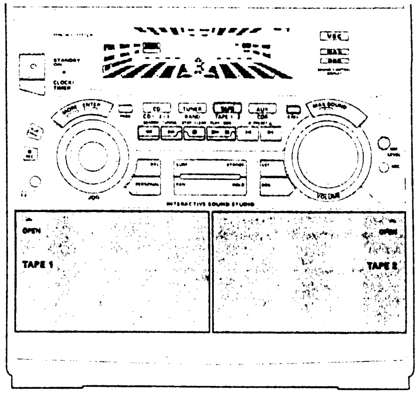
For MW band
To change from 9 kHz to 10 kHz or vice versa

Changing of tuning grid will erase all previously stored preset stations.

1 Disconnect the system from the AC power supply *(pull out the AC power cord)*

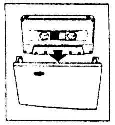
2 Press **TUNER** and **ENTER** depressed while reconnecting the system to the AC power supply.
  → Display will show "GRID 9" or "GRID 10".

Notes:
- *GRID 9 indicates that the tuning grid is in step of 9 kHz in MW band. GRID 10 indicates that the tuning grid is in step of 10 kHz in MW band.*
- *FM tuning grid will also be changed from 50 kHz to 100 kHz or vice versa. All preset radio stations will also be erased.*



Loading a tape

- Press **OPEN**.
- The tape deck door opens.
- Load the tape with the open side downward and the full spool to the left.
- Close the tape deck door.



Tape Playback

1 Press **TAPE** (TAPE 1•2) to select TAPE mode.
  → "TAPE 1" or "TAPE 2" will be displayed.
- Press **TAPE** (TAPE 1•2) again to select either tape deck 1 or tape deck 2.

2 Load the tape into the desired tape deck.

3 Press ▶ to start playback.

3a *(For Tape Deck 2 only)*
Press ▶ (PLAY•SIDE) again to switch playback between side A and B.
  → The **BACK** or **FRONT** flag appears on the display, depending on the side selected.

3b *(For Tape Deck 2 only)*
Press **A. REV** to select the different type of playback mode *(see auto reverse playback)*.

4 Press ■ to end playback.

Notes:
- *To change side before playback begins, use the SIDE button on the remote control.*

Auto Reverse Playback *(only on tape deck 2)*

- Press **A. REV** to select the different playback modes.

⇉ ...... to record or playback on one side of the tape. The tape stops at the end of one side.

⊃ ...... to record or playback on both sides of the tape. The tape then stops.

⊂⊃ ... to playback continuously on both sides of the tape up to a maximum of 10 times per side unless you press ■.

Rewind/Fast Forward *(only on tape deck 2)*

When playback is stopped

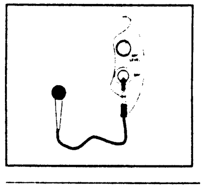
1 You can rewind or fast forward the tape by pressing ◀◀ or ▶▶ respectively.
  → "<<<" or ">>>" will be displayed depending on which button is pressed.
  → The tape will stop automatically at the end of the rewinding or fast forwarding.

2 Press ■ to stop rewinding or fast forwarding.

During playback

- Press and hold ◀◀ or ▶▶ until the desired passage is located.
  → During searching, the sound is reduced to a low volume
  → When you release ◀◀ or ▶▶, the tape continues playing.

Notes:
- *During rewinding or fast forwarding of a tape, it is also possible to select another source (e.g. CD, TUNER, or AUX)*
- *Before use, check and tighten slack tape with a pencil. Slack tape may get jammed or may burst in the mechanism.*
- *C-120 tape is extremely thin and is easily deformed or damaged. It is not recommended for use in this system.*
- *Store the tapes at room temperature and do not put them too close to a magnetic field (for example, a transformer, TV, or speaker).*



Microphone Mixing

1 Set the **MIC LEVEL** control to the minimum level to prevent acoustic feedback (e.g. a loud howling sound) before you connect the microphone.

2 Connect a microphone to the **MIC** socket.

3 Press **CD**, **TUNER**, **TAPE** or **AUX**.

4 Play the selected source.

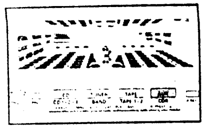
5 Adjust the volume level with **VOLUME** control.

6 Adjust the **MIC LEVEL** control to the mixing level that you want.

7 Start singing or talking through the microphone.

Note:
- *Keep the mic away from the speakers to prevent howling.*

AUX/CDR



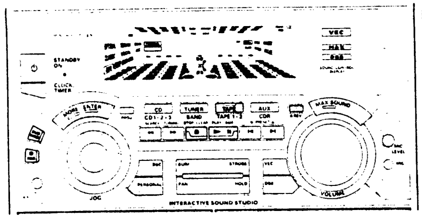
Selecting External Equipment

If you have connected the audio out terminals of the external equipment (TV, VCR, Laser Disc player, DVD player, or CD Recorder) to the AUX/CD-R IN terminals, you can hear the enhanced sound from the system

- Press **AUX** to select the CDR mode.
  → "CDR" will be displayed
- Press **AUX** again to select external mode
  → "AUX" will be displayed.

Notes:
- *There are two AUX modes:*
  - *i. the normal AUX mode.*
  - *ii. the CDR mode, where the LINE OUT of this mini system is muted. You will not be able to record or listen to the sound from the LINE OUT.*
- *You are advised not to listen to and record from the same source simultaneously*
- *All the sound control features (e.g. DSC, VEC, DBB, etc.) are available for selection.*

RECORDING



Notes:
- *If you do not intend to record via the microphone, unplug the microphone to avoid accidental mixing with other recording source.*
- *For recording, use only tape of IEC type I (normal tape) or IEC type II (CrO_2).*
- *The tape is secured at both ends with leader tape. At the beginning and end of tape, nothing will be recorded for 6 to 7 seconds.*
- *The recording level is set automatically, regardless of the position of Volume, DBB, VEC or DSC.*
- *To prevent accidental recording, break out the tab on the left shoulder of the tape side you want to protect.*
- *If "CHECK TAPE" is displayed, the protection tab has been broken. Put a piece of clear adhesive tape over the opening. Do not cover the CrO_2 tape detection hole when covering the tab opening.*

RECORDING

Recording from other sources *(only on tape deck 2)*

1 Press **TAPE** (TAPE 1•2) to select tape deck 2.
2 Load a blank tape into tape deck 2 with the open side downward.
3 Press **SIDE** on remote control to **select** the recording side.
  → The BACK or FRONT flag will be displayed, depending on the side selected.
4 Press **A. REV** to select the playback mode (⊐ or ⊃).
5 Press **CD**, **TUNER, TAPE 1** or **AUX**.
- Start playback of the selected source.
6 Press **REC** to start recording.
  → The REC flag starts flashing.
7 Press ■ to stop recording.

Notes:
- *Only ⊐ or ⊃ mode is available during recording*
- *During recording, it is not possible to listen to another source.*

Dubbing tapes *(from tape deck 1 to tape deck 2)*

1 Press **TAPE** (TAPE 1•2) to select tape deck 2
2 Load the prerecorded tape into tape deck 1 and a blank tape into tape deck 2
  → Make sure the tape in tape deck 1 has its full spool to the left
3 *(For Tape Deck 2 only)*
  Press **SIDE** on the remote control to select the recording side.
4 Press **DUB (HSD)** ***once*** for normal speed dubbing or ***twice*** *(within 2 seconds)* for high speed dubbing.
  → "NORMAL" (normal speed) or "FAST" (high speed) will be displayed, followed by "DUBBING".
  → The HSD flag appears on the display during high speed dubbing
- Dubbing will start immediately.
  → The REC flag starts flashing
5 Press ■ to stop dubbing.

Notes:
- *At the end of side A, flip the tapes to side B and repeat the procedure.*
- *Dubbing of tapes is only possible from tape deck 1 to tape deck 2.*
- *To ensure good dubbing, use tapes of the same length.*
- *During high speed dubbing in Tape mode, the sound is reduced to a low volume.*
- *You can listen to another source while dubbing.*

CD Synchro Start Recording

1 Load a blank tape into tape deck 2 and a disc into a disc tray.
2 Press **CD** to select CD mode.
- You can program the tracks in the order you want them to be recorded (see Programming Tracks). If you do not, the tracks are recorded according to the order on the selected disc.
3 Press **REC** to start recording.
  → The REC flag starts flashing.
- CD will start playback automatically.
4 Press ■ to stop recording.

Recording the mixed sound / One Touch Recording

- During microphone mixing, you can record the mixed sound on a tape in tape deck 2 except dubbing mode.
- For One Touch Recording, as soon as you press **REC**, the current source (CD, TUNER or AUX) will be recorded on tape deck 2

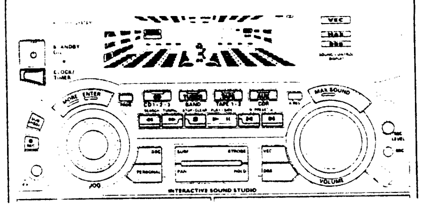
1 Load a blank tape in tape deck 2.
2 Press **REC** to start recording
  → The REC flag starts flashing.
3 Press ■ to stop recording.

Note:
- *When you press RECORD while in TAPE mode, "SELECT SOURCE" will be displayed. One Touch Recording is not possible in TAPE mode.*

Digital Recording via Digital Out

For CD digital recording, please refer to the Instructions Manual of the CD Recorder, digital audio equipment, etc.

CLOCK



Viewing the Clock

You can view the clock (if it is set) while the system is in standby mode or any source mode. It will be displayed for about 7 seconds.

- Press **CLOCK/TIMER** briefly *(on the system only)*.
  → " 10:38" (the current time) will be displayed.
  → "-- --" will be displayed if the clock is not set.

Setting the Clock

The clock is set in 24-hour mode, e.g. "00:00" or "23:59". Before setting the clock, you must be in the View Clock mode.

1 Press **CLOCK/TIMER** to select clock mode.
  → "00:00" or the current time starts flashing.
2 Set the hour with ◀◀ or ▶▶.
3 Set the minute with |◀ or ▶|.
4 Press **CLOCK/TIMER** again to store the setting.
  → The clock starts.

- To exit without storing the setting, press ■ on the system.

Notes:
- *During clock setting, if no button is pressed within 90 seconds, the system will exit clock setting mode automatically.*
- *When a power interruption occurs, the clock setting is erased.*

TIMER

Setting the Timer

- The system can switch on to CD, TUNER, or TAPE 2 mode automatically at a preset time. It can serve as an alarm to wake you up.
- Before setting the timer, make sure the clock is set correctly.
- The timer will always be switched on once it is set.
- **The volume of the timer will start to increase from the minimum level until the volume level before the set is switched to standby mode.**

1 Press and hold **CLOCK/TIMER** for more than 2 seconds to select timer mode.
  → "00:00" or the last set timer starts flashing. The TIMER flag flashes.
  → The last selected source is lit while other available sources are flashing.
2 Press **CD**, **TUNER** or **TAPE** to select the desired source.
- Before selecting CD or TAPE, make sure a CD or tape is loaded in the CD tray or tape deck 2.
3 Press ◀◀ or ▶▶ to set the hour for the timer to start.
4 Press |◀ or ▶| to set the minute for the timer to start.
5 Press **CLOCK/TIMER** to store the start time.
  → The timer is now set
  → The TIMER flag remains on the display.

- At the preset time, the timer will be activated.
  → The selected source will be played.

Notes:
- *During timer setting, if no button is pressed within 90 seconds, the system will exit timer setting mode automatically.*
- *If the source selected is TUNER, the last tuned frequency will be switched on.*
- *If the source selected is CD, playback will begin with the first track of the last selected disc. If the CD trays are empty, the TUNER will be selected instead.*
- *If the source selected is TAPE, and if the preset time is reached during high speed dubbing, the TUNER will be selected instead.*

To switch off the TIMER
1 Press **CLOCK/TIMER** for more than 2 seconds.
2 Press ■ on the system to cancel the timer.
  → The timer is now switched off.
  → The display will show "OFF" and the TIMER flag disappears.

To start the TIMER again *(for the same preset time and source)*
1 Press **CLOCK/TIMER** for more than 2 seconds.
2 Press **CLOCK/TIMER** again to store the start time.
  → The timer is now switched on.
  → The TIMER flag appears on the display.

SLEEP TIMER

Sleep Timer *(only on remote control)*

This feature allows you to select a length of time after which the system will switch to the standby mode automatically.

- Press **SLEEP TIMER** on the remote control repeatedly to select a period of time.
  → The selections are as follows (time in minutes):
  60 → 45 → 30 → 15 → OFF → 60 ...
  → "SLEEP XX" or "OFF" will be displayed. "XX" is the time in minutes.
- When you reach the desired length of time, stop pressing the **SLEEP TIMER** button.
  → After this amount of time passes, the system will switch to the standby mode.

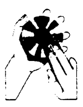
To switch off the sleep timer
- Press **SLEEP TIMER** repeatedly until "OFF" is displayed, or press the **STANDBY•ON** button.

MAINTENANCE

Maintenance

Cleaning the Cabinet
- Use a soft cloth slightly moistened with a mild detergent solution. Do not use a solution containing alcohol, spirits, ammonia or abrasives.

Cleaning Discs



- When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the center out.
- Do not use solvents such as benzine, thinner, commercially available cleaners, or antistatic spray intended for analog records.

Cleaning the CD lens
- After prolonged use, dirt or dust may accumulate at the CD lens. To ensure good playback quality, clean the CD lens with Philips CD Lens Cleaner or any commercially available cleaner. Follow the instructions supplied with cleaner.

Cleaning the Heads and the Tape Paths
- To ensure good recording and playback quality, clean the heads, the capstan(s), and pressure roller(s) after every 50 hours of tape operation.
- Use a cotton swab slightly moistened with cleaning fluid or alcohol.
- You can also clean the heads by playing a cleaning tape once.

Demagnetizing the heads
- Use a demagnetizing tape available at your dealer.

TROUBLESHOOTING

Warning! Under no circumstances you should try to repair the set yourself as this will invalidate the guarantee. Do not open the set as there is a risk of electric shock.

- If a fault occurs, check the points listed below before taking the system for repair.
- Should any problems persist after you have made these checks, consult your nearest dealer or service center

CD Player Operation

"NO DISC" is displayed.

- The disc is inserted upside down.
- → *Place CD with printed side up.*
- *Moisture condensation at the lens.*
- → *Wait until lens has adjusted to normal room temperature*
- There is no disc in the CD tray
- → *Insert a CD.*
- The CD is dirty, badly scratched or warped.
- → *Clean or replace the CD*
- The CD lens is dirty or dusty
- → *See section under Maintenance.*

"DISC NOT FINALISED" is displayed.

- The CD-RW or CD-R disc is not properly recorded for the use of a standard CD player
- → *Read the instruction booklet of your CD-Rewritable or CD-Recorder on how to finalize a recording.*
- The CD is badly scratched or dirty.
- → *Replace or clean CD*

Radio Reception

Poor radio reception

- The signal is too weak.
- → *Adjust the antenna*
- → *Connect an external antenna for better reception.*
- The TV or VCR is too close to the stereo system
- → *Separate the stereo system from the TV or VCR.*

Cannot tune to station.

- Wrong tuning grid.
- → *Switch to the correct tuning grid.*

Tape Deck Operation

Recording or playback cannot be made or there is a decrease in audio level.

- *Dirty tape heads, capstans or pressure rollers.*
- → *See section on tape deck maintenance.*
- Magnetic build-up in the record/playback head
- → *Use demagnetizing tape.*

General

System does not react when any button is pressed.

- Electrostatic discharge.
- → *Press STANDBY-ON to switch the system off. Remove the AC power plug from the wall outlet, then reconnect the power plug and switch on the system again.*

No or poor sound.

- Volume is not turned up.
- → *Adjust VOLUME.*
- The headphones are connected.
- → *Disconnect the headphones.*
- Speakers are not connected or are connected wrongly.
- → *Check that the speakers are connected correctly.*
- → *Make sure the stripped speaker wire is clamped*

Reversed left and right sound.

- Speakers are connected wrongly.
- → *Check the speaker connections and location.*

Lack of bass sound or apparently imprecise physical location of musical instruments.

- Speakers are connected wrongly.
- → *Check the speaker connection for proper phasing, red/black wires to red/black terminals.*

Remote control has no effect on the system.

- Wrong source is selected.
- → *Select the source (CD, TUNER, etc.) before pressing the function button, (▶, ⏮, ⏭, etc.).*
- The distance to the system is too large.
- → *Reduce the distance.*
- Batteries are inserted incorrectly.
- → *Insert the batteries with their polarities (+/– signs) as indicated.*
- Batteries are exhausted.
- → *Replace the batteries.*

Timer not working.

- Clock is not set.
- → *Set the clock.*
- Timer is not switched on.
- → *Press CLOCK/TIMER to switch on the timer.*
- Dubbing/recording is in progress.
- → *Stop dubbing/recording.*

Clock setting is erased.

- There was a power failure.
- → *Reset the clock.*

System displays features automatically; buttons flash continuously.

- Demonstration mode is switched on.
- → *Press and hold ■ (on the system only) for 5 seconds to switch off the demonstration.*

A howling sound at external source.

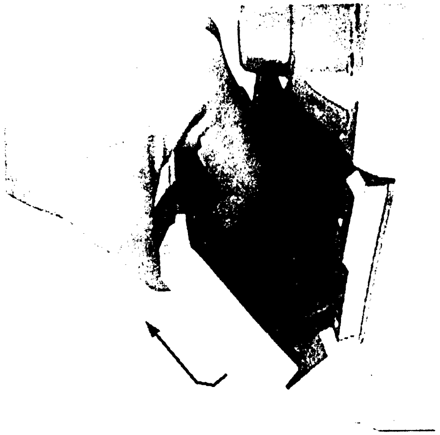
- You hear feedback when you are listening and recording from the same source simultaneously.
- → *Press AUX to select CDR mode.*

All lighted buttons are not lit.

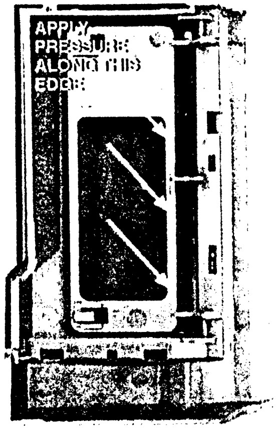
- Equalizer Display is switched on in NITE mode.
- → *Rotate JOG to other Equalizer Display.*

DISMANTLING INSTRUCTIONS

Dismantling of the Cassette Cover



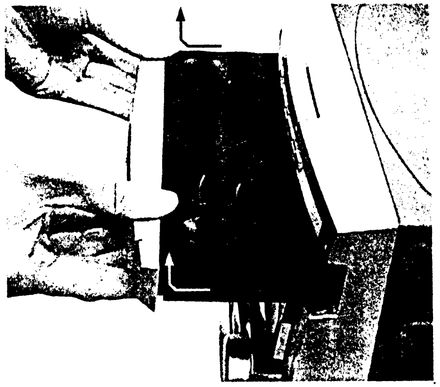
Remove Cassette Door



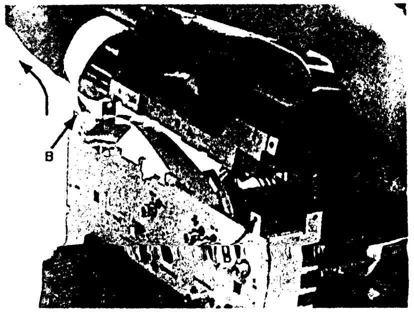
Cassette Door

Dismantling of the CDC Module and Front Panel

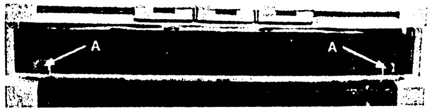
1) Loosen the 16 screws to remove the Cabinet Rear (pos 259) of the set :-
   - 5 screws each on the left side & right side of the Cabinet Rear.
   - 6 screws at the rear of the Cabinet Rear.
2) Slide out the CDC tray and remove the Cover CDC (pos 106) as indicated.
3) Loosen 2 screws A and 2 screws B to remove the CDC Module (pos 1104) as indicated.
4) Remove 6 screws J as indicated to loosen the AF Board (pos 1101-B) and 1 screw Q as indicated to loosen the Bar Tuner (pos 263).
   (See Plate Rear and Power Module pictures)
5) Remove 1 screw (pos 305) at the bottom to separate the Front Panel Assembly from the Plate Bottom (pos 236).



Remove Cover CDC



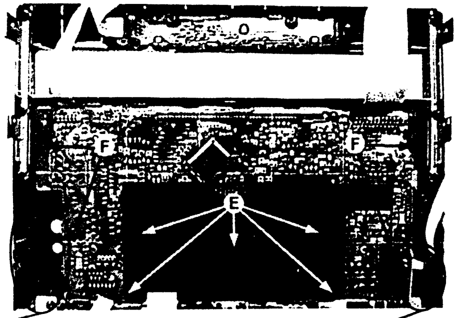
Remove CDC Module

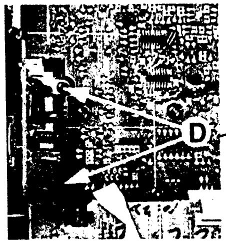


Front CDC

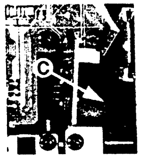
Dismantling of the Front Board

1) Remove 1 screw C as indicated to loosen the Headphone Board (pos 1101-A).
2) Remove 2 screws D as indicated to loosen the Karaoke Board (pos 1100-C) for set with karaoke.
3) Remove 5 screws E as indicated to loosen the Plate Front (pos 254).
4) Remove 4 screws F as indicated to loosen the Front Board (pos 1100-A).





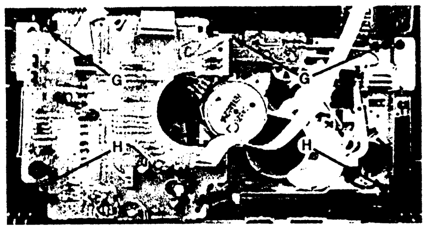
Remove Karaoke Board



Remove Headphone Board

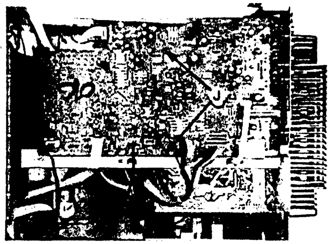
Dismantling of the ETF Module

1) Remove 6 screws (3 screws G and 3 screws H) as indicated to loosen the ETF6 Module (pos 1103).

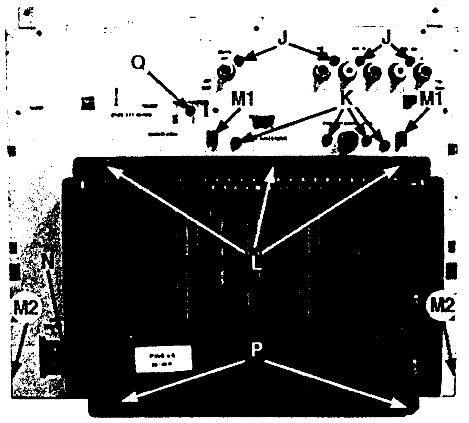


Dismantling of Plate Rear and Power Module

1) Remove 6 screws J as indicated to loosen the AF Board (pos 1101-B) and 1 screw Q as indicated to loosen the Bar Tuner (pos 263).
2) Remove 4 screws K and uncatch M1 as indicated to loosen the Tuner Board (pos 1102).
3) Remove 3 screws L and 1 screw N (if obstructed) and uncatch M2 as indicated to take out the Plate Rear(pos 234).
4) Remove 2 screws P as indicated to free the Power Module (pos 1105) from the Bottom Plate assembly.



Top View



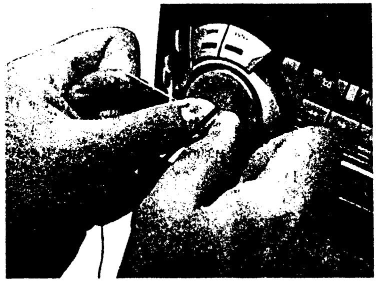
Repair Hints

1) The Jog Rotary (pos 142) can be remove by inserting a strong string into the slot and pull it out in the direction as indicated. See picture 1.

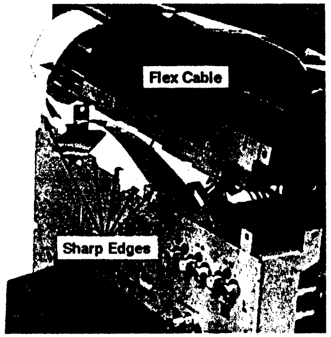
3) During re-assembly of the set, care should be taken to dress all the flex cable wires properly to prevent any damaged cause by any sharp metal edges or any other metal parts. See picture 2.

4) Due to the short flex cable wires in the ETF Module, the pc board should be disconnected and reconnected on the reverse side of the tape mechanism to keep it electrically connected during repair. See picture 3.

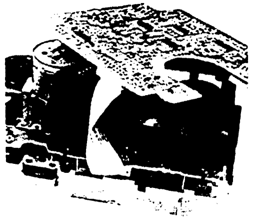
5) During repair it is possible to disconnect the Tuner board and CDC Module completely unless the fault is suspected to be in that area. This will not affect the performance of the rest of the set.



Picture 1

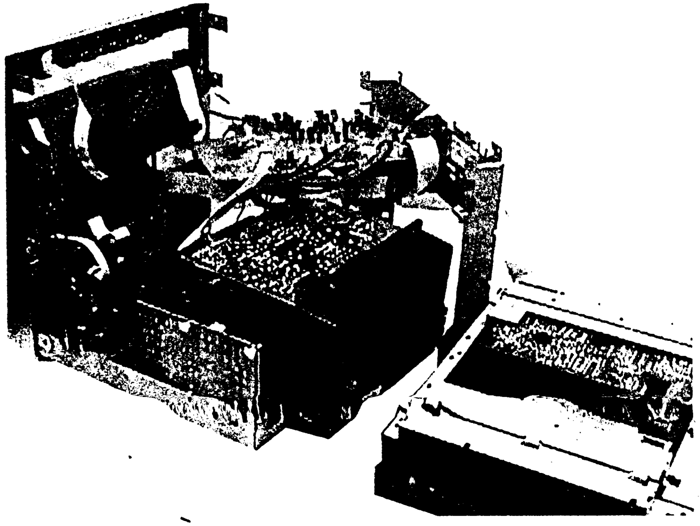


Picture 2

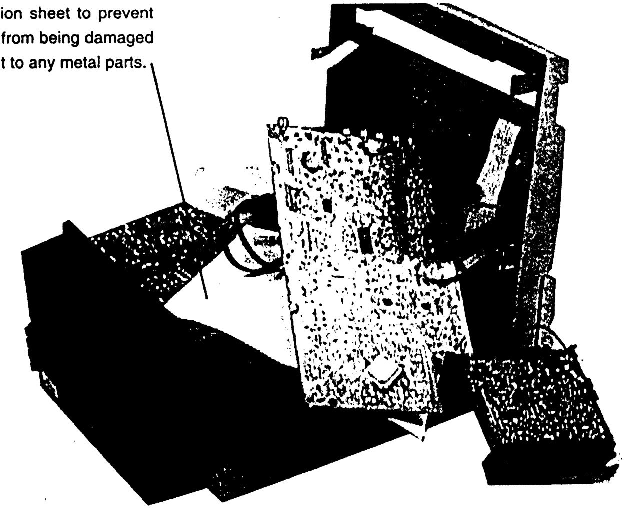


Picture 3

Service pos A

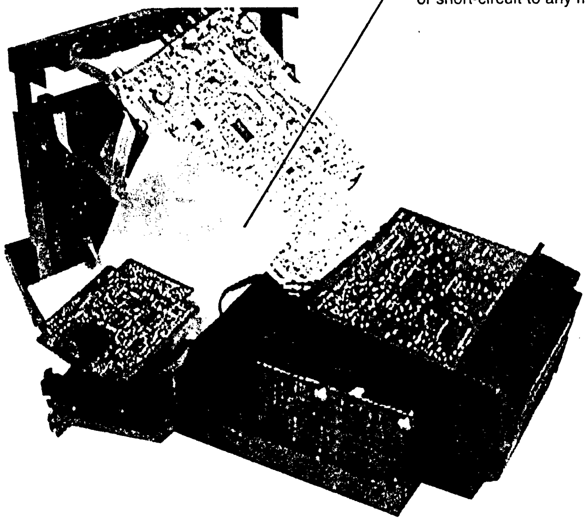


Service pos B



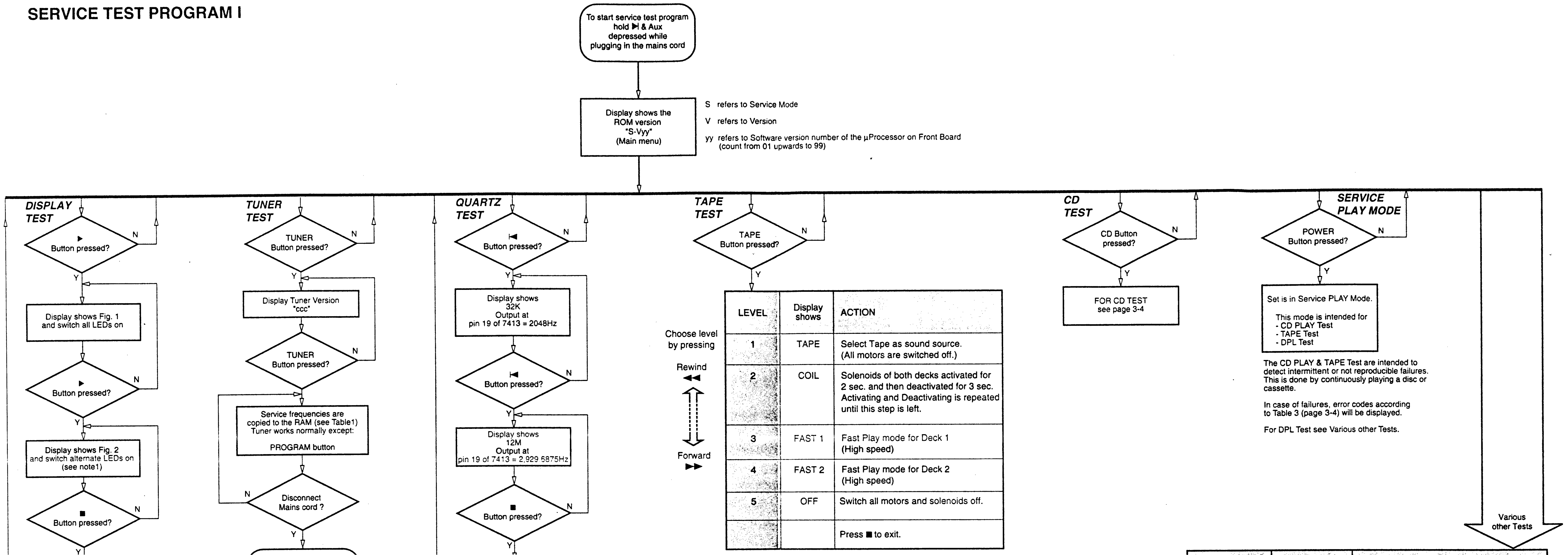
Use a insulation sheet to prevent the AF board from being damaged or short-circuit to any metal parts.

Service pos C



Use a insulation sheet to prevent the ETF board from being damaged or short-circuit to any metal parts.

SERVICE TEST PROGRAM I


To start service test program hold ⏭ & Aux depressed while plugging in the mains cord
Display shows the ROM version "S-Vyy" (Main menu)
DISPLAY TEST
▶ Button pressed?
Display shows Fig. 1 and switch all LEDs on
▶ Button pressed?
Display shows Fig. 2 and switch alternate LEDs on (see note1)
■ Button pressed?
TUNER TEST
TUNER Button pressed?
Display Tuner Version "ccc"
TUNER Button pressed?
Service frequencies are copied to the RAM (see Table1) Tuner works normally except: PROGRAM button
Disconnect Mains cord ?
Service Mode left
QUARTZ TEST
⏮ Button pressed?
Display shows 32K Output at pin 19 of 7413 = 2048Hz
⏮ Button pressed?
Display shows 12M Output at pin 19 of 7413 = 2,929 6875Hz
■ Button pressed?
TAPE TEST
TAPE Button pressed?
Choose level by pressing
Rewind ◀◀
Forward ▶▶
CD TEST
CD Button pressed?
FOR CD TEST see page 3-4
SERVICE PLAY MODE
POWER Button pressed?
Set is in Service PLAY Mode.
This mode is intended for
- CD PLAY Test
- TAPE Test
- DPL Test
Various other Tests
Y
N

S refers to Service Mode

V refers to Version

yy refers to Software version number of the µProcessor on Front Board (count from 01 upwards to 99)

LEVEL	Display shows	ACTION
1	TAPE	Select Tape as sound source. (All motors are switched off.)
2	COIL	Solenoids of both decks activated for 2 sec. and then deactivated for 3 sec. Activating and Deactivating is repeated until this step is left.
3	FAST 1	Fast Play mode for Deck 1 (High speed)
4	FAST 2	Fast Play mode for Deck 2 (High speed)
5	OFF	Switch all motors and solenoids off.
		Press ■ to exit.

The CD PLAY & TAPE Test are intended to detect intermittent or not reproducible failures. This is done by continuously playing a disc or cassette.

In case of failures, error codes according to Table 3 (page 3-4) will be displayed.

For DPL Test see Various other Tests.

TEST	***Activated with***	***ACTION***
EEPROM TEST	▶▶ ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "ERROR" will be displayed.
EEPROM FORMAT TEST	◀◀	Load default data. Display shows "NEW" for 1 second. ***Caution!*** ***All presets from the customer will be lost!!***
KEY TEST	⏭ ■ to Exit	Key numbers according Table 2 are shown on the display.
FAST CLOCK TEST	CLOCK/TIMER	The clock is switched to fast mode. "FAST" is displayed for 1 sec. Press CLOCK/TIMER again to reset the clock to normal. "NORMAL" displayed for 1 sec.
ADC TEST	AUX ■ to Exit	The display shows "ADC1_aaa". Press AUX again to shows "ADC2_bbb", "ADC3_ccc", "ADC4_ddd" and "ADC5_eee", where "aaa", "bbb", "ccc", "ddd" and "eee" is the ADC value between 0 - 255 representing NTC, SA_1, SA_2, SA_3 and SA_4 lines respectively. The set will go to standby when temperature is too high (NTC line ADC value is below 76).
VOLUME TEST	Rotary Volume Knob or Jog Shuttle	Display shows volume value for 2 seconds. Volume increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
DPL TEST (only possible in Service Play Mode)	DPL	The set enters into Pro-logic install mode. The noise-source switches between Left, Center, Right and Rear speakers. Pro-logic settings cannot be install in this test.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

PRESET	Europe "EUR"	East Europe Extended-band "EAS"	East Europe "EAS"	USA "USA"	Oversea "OSE"
1	87.5MHz	65.81MHz	87.5MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	74MHz	531kHz	530kHz	531/530kHz
4	1602kHz	87.5MHz	1602kHz	1700kHz	1602/1700kHz
5	558kHz	531kHz	558kHz	560kHz	558/560kHz
6	1494kHz	1602kHz	1494kHz	1500kHz	1494/1500kHz
7	153kHz	558kHz	87.5MHz	98MHz	87.5MHz
8	279kHz	1494kHz	87.5MHz	87.5MHz	87.5MHz
9	198kHz	98MHz	87.5MHz	87.5MHz	87.5MHz
10	98MHz	70.01MHz	87.5MHz	87.5MHz	87.5MHz
11	87.5MHz	65.81MHz	98MHz	87.5MHz	98MHz

Table 1

Keys activated	Display shows	Keys activated	Display shows	Keys activated	Display shows
No Key pressed	--	RECORD *	12	■ (Exit Test)	
Any Remote control key	RC	TAPE DUBBING *	13	▶II	26
DISC CHANGE	1	MORE	14	⏮	27
OPEN / CLOSE	2	ENTER	15	⏭	28
DISC 1	3	PROGRAM	16	DSC	29
DISC 2	4	CD	17	SURF	30
DISC 3	5	TUNER	18	STROBE	31
STANDBY ON	6	TAPE	19	VEC	32
CLOCK / TIMER	7	AUX	20	PERSONAL	33
DPL *	8	TAPE MODE *	21	PAN	34
DOLBY B *	9	MAX SOUND	22	HOLD	35
RDS *	10	◀◀	23	DBB	36
NEWS *	11	▶▶	24		

* Not for all type/version.

Table 2

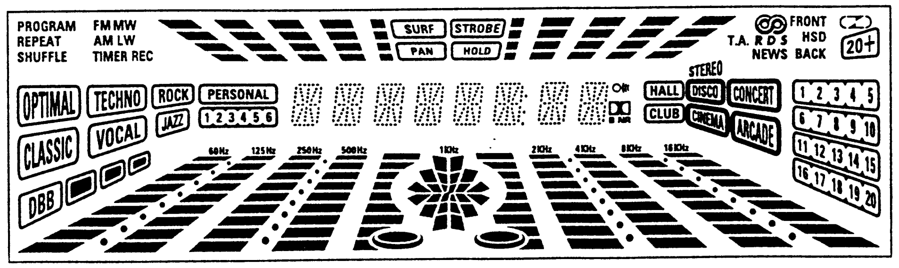
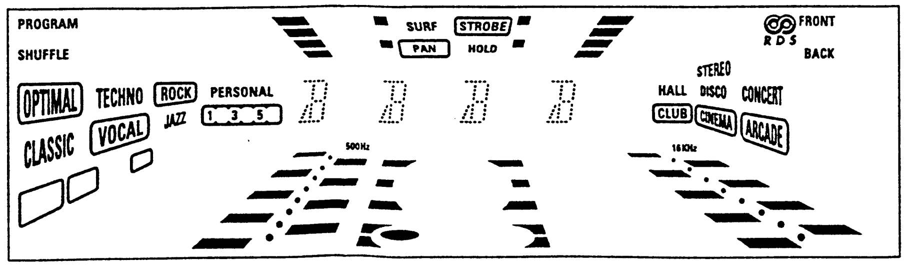

PROGRAM
REPEAT
SHUFFLE
FM MW
AM LW
TIMER REC
SURF
STROBE
PAN
HOLD
T.A.
R D S
NEWS
FRONT
HSD
BACK
20+
STEREO
OPTIMAL
TECHNO
ROCK
PERSONAL
CLASSIC
VOCAL
JAZZ
DBB
HALL
DISCO
CONCERT
CLUB
CINEMA
ARCADE

Figure 1

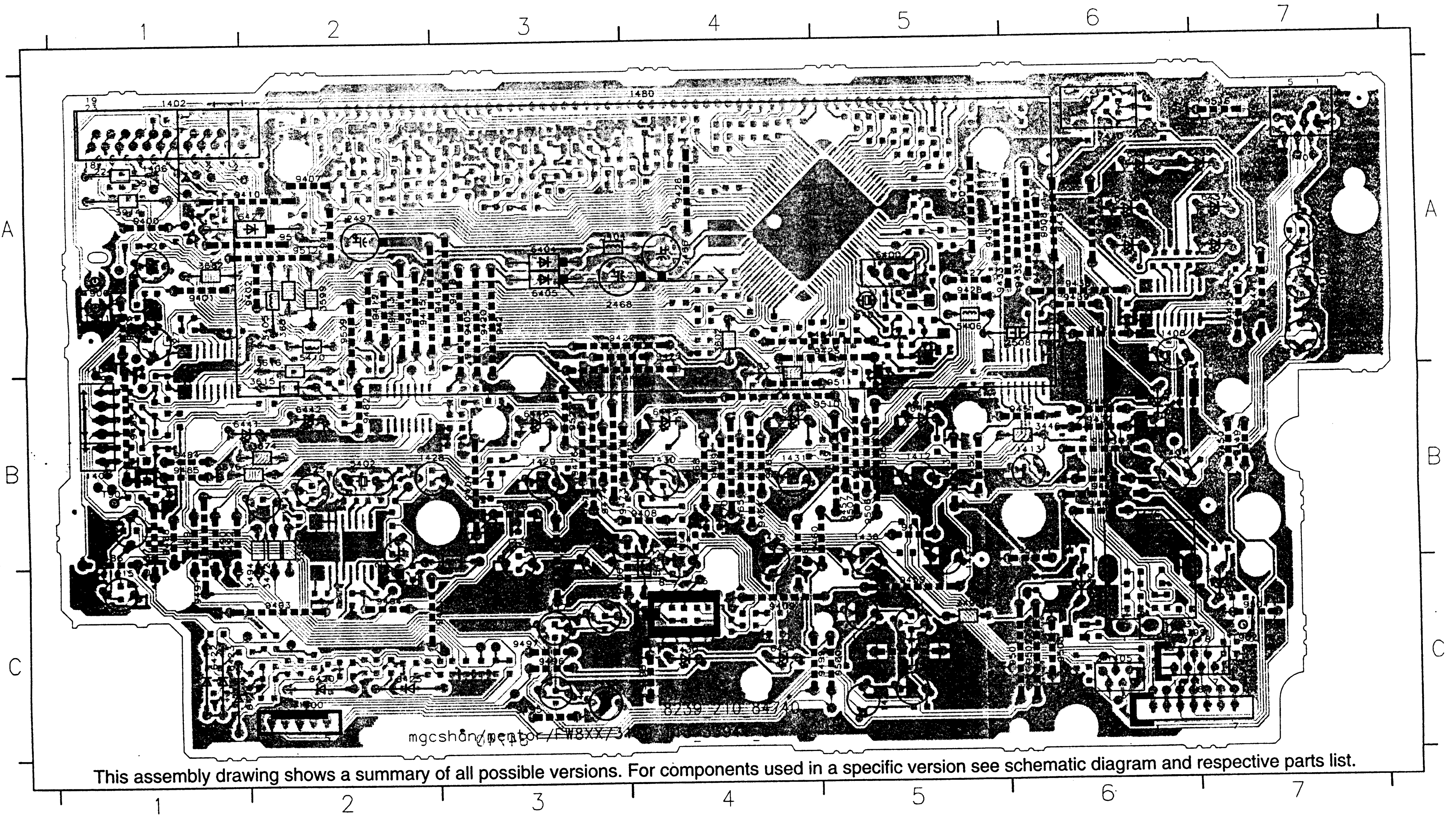

PROGRAM
SHUFFLE
SURF
STROBE
PAN
HOLD
FRONT
R D S
BACK
STEREO
OPTIMAL
TECHNO
ROCK
PERSONAL
CLASSIC
VOCAL
JAZZ
HALL
DISCO
CONCERT
CLUB
CINEMA
ARCADE

note1 : DISC 1, DISC 3, CD, TAPE, DPL Surround, DPL Centre, MAX SOUND, ENTER.

Figure 2

FRONT BOARD - COMPONENT LAYOUT

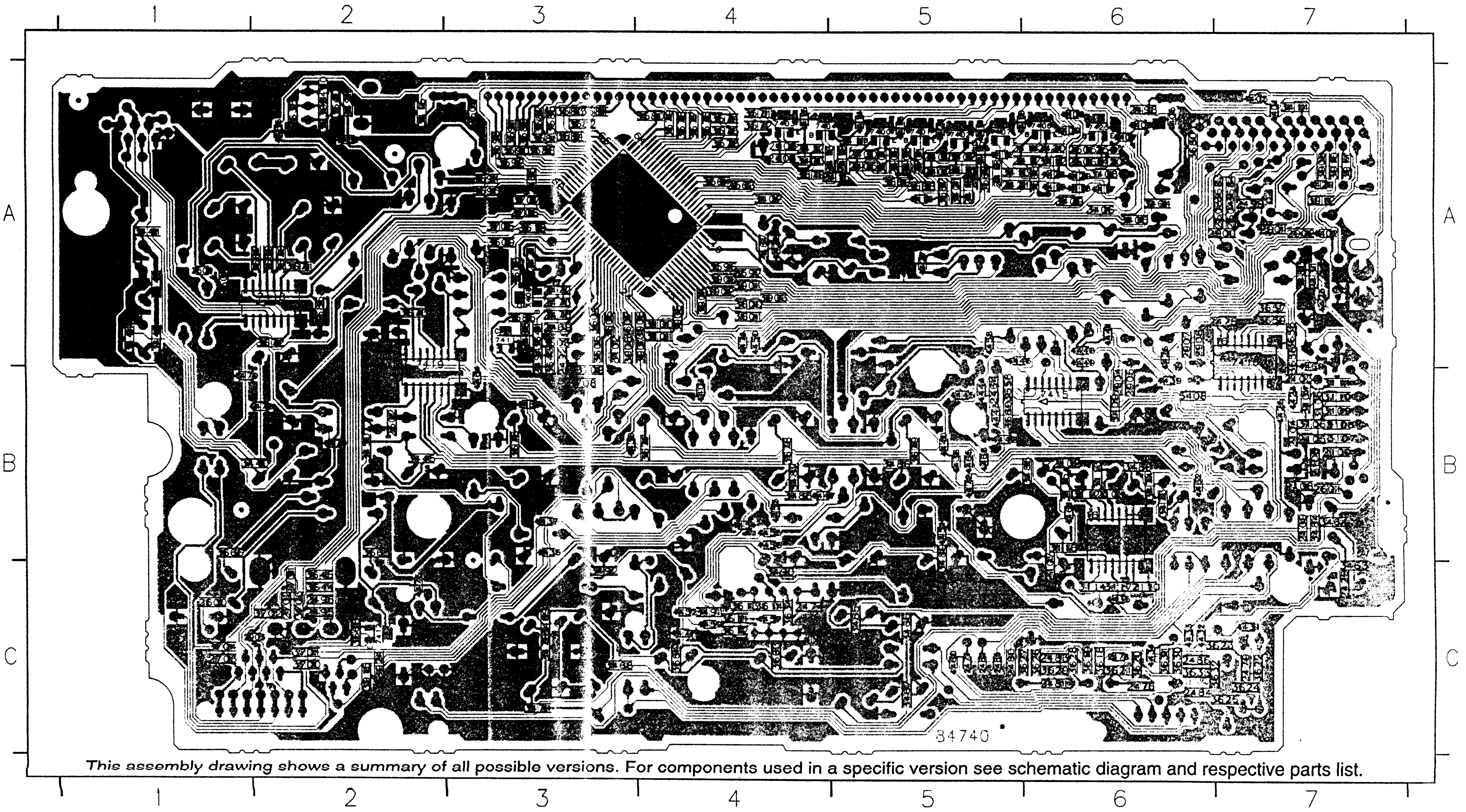
1404	A1	1416	C3	1428	B2	2111	B2	3602	A4	5402	B2	6426	C1	6440	B6	9404	B3	9416	A3	9428	A5	9441	A7	9453	B5	9473	B3	9487	B1	9499	C4	9511	B5
1405	C6	1417	C3	1429	B3	2466	A4	3615	B2	5403	B4	6427	A2	6441	B1	9405	A3	9417	B5	9430	A5	9442	A7	9457	B5	9474	B3	9488	B1	9500	C5	9512	A2
1406	A1	1418	C3	1430	B4	2468	A3	3616	A2	5404	A3	6430	C4	6442	B2	9406	C3	9418	A3	9431	A5	9443	B6	9459	C5	9475	B3	9489	B1	9501	C6	9513	A2
1407	B6	1419	C3	1431	B4	2497	A2	3674	B2	5405	A2	6431	C4	6443	B5	9407	A2	9419	B5	9432	B6	9444	B3	9460	B4	9476	B3	9490	B1	9502	C6	9515	A1
1408	A6	1420	C5	1432	B3	2508	A6	3675	B1	5406	A5	6432	C6	6444	B4	9408	B4	9420	A3	9433	A5	9445	B6	9461	B4	9478	B3	9491	C1	9503	C6	9516	A7
1409	A7	1421	C5	1433	B3	3103	A4	3681	A2	5410	A2	6433	C7	6445	B4	9409	C4	9421	A3	9434	A6	9446	B6	9463	B4	9479	B3	9492	B1	9504	C7	9517	B6



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

FRONT BOARD - CHIP LAYOUT

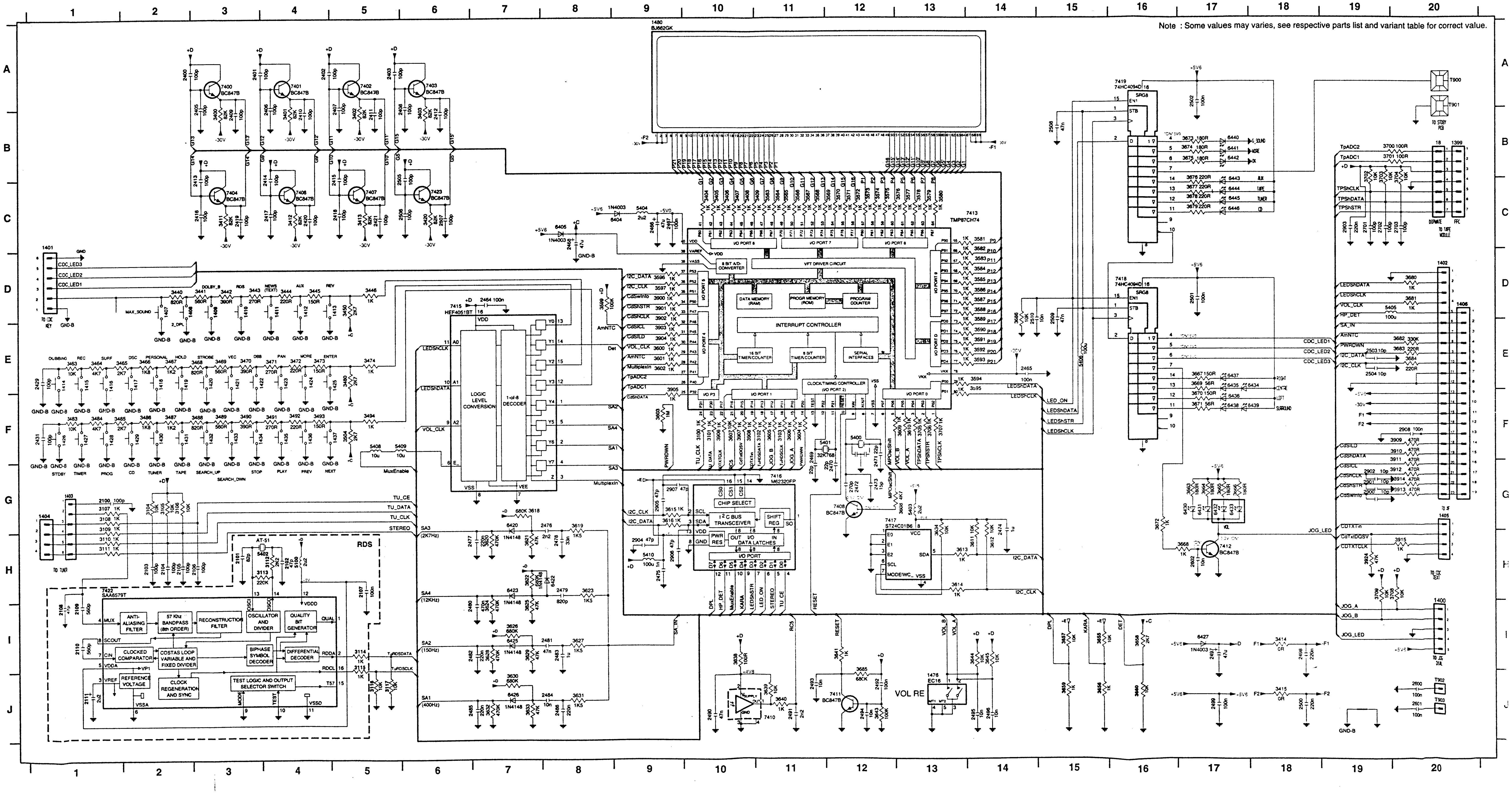
2403	A4	2464	B5	2486	C6	2601	B7	3109	B7	3412	A6	3471	C3	3569	A5	3589	A3	3612	C4	3638	A2	3670	A2	3707	A3	4403	A7	4423	A7	4443	B5	4463	B3	7404	A4
2405	A5	2465	A3	2490	A2	2701	C2	3110	B7	3413	A5	3473	B6	3570	A4	3590	A3	3613	C4	3639	A2	3671	A2	3708	B3	4404	B4	4424	B7	4444	B5	4464	B3	7406	A6
2406	A5	2467	A4	2491	A2	2702	C2	3111	B7	3414	A7	3474	B6	3571	A4	3591	A3	3614	C4	3640	A2	3672	A2	3709	B3	4405	A6	4425	B7	4445	B5	4465	B5	7407	A5
2407	A5	2469	A3	2492	A3	2703	C1	3112	B6	3415	A2	3480	B6	3572	A4	3592	A3	3618	C6	3641	A3	3673	A2	3900	A4	4406	A6	4426	A6	4446	A5	4466	A2	7408	A3
2408	A4	2470	A3	2493	A3	2900	A7	3113	B6	3420	A6	3483	A7	3573	A4	3593	A3	3619	C6	3643	A3	3676	B3	3901	A4	4407	A6	4427	A5	4447	B4	4467	A2	7411	A3
2409	A5	2471	A3	2494	A3	2901	A7	3114	C6	3440	B2	3484	B7	3574	A4	3594	A3	3620	C6	3644	C2	3677	B4	3902	A4	4408	A6	4428	A6	4448	A6	4468	B5	7412	C2



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

FRONT BOARD - CIRCUIT DIAGRAM

18	B20
1399	B20
1400	I20
1401	C1
1402	D20
1403	G1
1404	G1
1405	G20
1406	D20
1407	D2
1408	D3
1409	D3
1410	D3
1411	D4
1412	D4
1413	D5
1414	E1
1415	E1
1416	E1
1417	E2
1418	E2
1419	E2
1420	E3
1421	E3
1422	E4
1423	E4
1424	E4
1425	E5
1426	F1
1427	F1
1428	F1
1429	F2
1430	F2
1431	F2
1432	F3
1433	F3
1434	F4
1435	F4
1436	F4
1437	F5
1476	J13
1480	A9
2100	G1
2101	H3
2102	H4
2103	H2
2104	H2
2105	H2
2106	H3
2107	H5
2108	I1
2109	I1
2110	I1
2111	J1
2400	A2
2401	A3
2402	A4
2403	A5
2405	A3
2406	A4
2407	A5
2408	A6
2409	B3
2410	B4
2411	B5
2412	B6
2413	B3
2414	B4
2415	B5
2416	C3
2417	C4
2418	C5
2419	C3
2420	C4
2421	C5
2429	E1
2431	F1
2464	D7
2465	E14
2466	C9
2467	C9
2468	C8
2469	F11
2470	G12
2471	G12
2472	G12
2473	G12
2474	G14
2475	H9
2476	G8
2477	H7
2478	H8
2479	H8
2480	I7
2481	I8
2482	I7
2483	I8
2484	J8
2485	J7
2486	J8
2490	J10
2491	J11
2492	J12
2493	J11
2494	J12
2495	J14
2496	J14
2497	I17
2498	I18
2499	J17
2500	J18
2501	D17
2502	A17
2503	E19
2504	E19
2505	B6
2506	C6
2507	C6
2508	B15
2509	D15
2510	D14
2600	J20
2601	J20
2602	H17
2701	C19
2702	C19
2703	C20
2900	G19
2901	G19
2902	G19
2903	C19
2904	H9
2905	G9
2906	H9
2907	G9
2908	F20
3100	F10
3101	F10
3102	F11
3103	F11
3104	G2
3105	G2
3106	G2
3107	G1
3108	G1
3109	G1
3110	H1
3111	H1
3112	H4
3113	H4
3114	I5
3115	I5
3116	J5
3117	J5
3400	B3
3401	B4
3402	B5
3403	B6
3404	C10
3405	C10
3406	C10
3407	C10
3408	C10
3409	C11
3411	C3
3412	C4
3413	C5
3414	I18
3415	J18
3420	C6
3440	D2
3441	D3
3442	D3
3443	D3
3444	D4
3445	D4
3446	D5
3450	D5
3463	E1
3464	E1
3465	E2
3466	E2
3467	E2
3468	E3
3469	E3
3470	E3
3471	E4
3472	E4
3473	E4
3474	E5
3480	E5
3483	F1
3484	F1
3485	F1
3486	F2
3487	F2
3488	F3
3489	F3
3490	F3
3491	F4
3492	F4
3493	F4
3494	F5
3504	F5
3563	C11
3564	C11
3565	C11
3566	C11
3567	C11
3568	C11
3569	C12
3570	C12
3571	C12
3572	C12
3573	C12
3574	C12
3575	C12
3576	C13
3577	C13
3578	C13
3579	C13
3580	C13
3581	C14
3582	C14
3583	D14
3584	D14
3585	D14
3586	D14
3587	D14
3588	D14
3589	D14
3590	E14
3591	E14
3592	E14
3593	E14
3594	E14
3595	E14
3596	D9
3597	D9
3599	D8
3600	E9
3601	E9
3602	E9
3603	F9
3604	F11
3605	F11
3606	F11
3607	F10
3608	G13
3609	F13
3610	F13
3611	H14
3612	H14
3613	H13
3614	H13
3615	G9
3616	G9
3618	G7
3619	G8
3620	H7
3621	H7
3622	H7
3623	H8
3624	I7
3625	I7
3626	I7
3627	I8
3628	I7
3629	I7
3630	J7
3631	J8
3632	J7
3633	J7
3634	G13
3638	I10
3639	J11
3640	J11
3641	I12
3643	J12
3644	I14
3645	I14
3655	I15
3656	J15
3657	I15
3658	I16
3659	J15
3660	J16
3663	G17
3664	G17
3665	G17
3666	G17
3667	E17
3668	H17
3669	E17
3670	F17
3671	F17
3672	G16
3673	B17
3674	B17
3675	B17
3676	C17
3677	C17
3678	C17
3679	C17
3680	D20
3681	D20
3682	E20
3683	E20
3684	E20
3685	J12
3686	D14
3700	B19
3701	B19
3702	B19
3703	B19
3704	B20
3705	F13
3706	F13
3707	F13
3708	H20
3709	H19
3900	D9
3901	D9
3902	D9
3903	E9
3904	E9
3905	F9
3906	F10
3907	F10
3908	F10
3909	F20
3910	F20
3911	G20
3912	G20
3913	G20
3914	G20
3915	H20
3924	H19
5100	H4
5400	F12
5401	F12
5402	H4
5403	G13
5404	C9
5405	D20
5406	E15
5408	F5
5409	F6
5410	H9
6404	C9
6405	C8
6420	G7
6422	H8
6423	H7
6425	I7
6426	J7
6427	I17
6430	G17
6431	G17
6432	G17
6433	G17
6434	E18
6435	E17
6436	F17
6437	E17
6438	F17
6439	F18
6440	B17
6441	B17
6442	B17
6443	C17
6444	C17
6445	C17
6446	C17
7400	A3
7401	A4
7402	A5
7403	A6
7404	C3
7406	C4
7407	C5
7408	G12
7410	J11
7411	J12
7412	H17
7413	C14
7415	D6
7416	G11
7417	G12
7418	D16
7419	A16
7422	H1
7423	C6
T900	A20
T901	A20
T902	J20
T903	J20


Note : Some values may varies, see respective parts list and variant table for correct value.
1480
BJ662GK
7413
TMP87CH74
7415
HEF4051BT
LOGIC LEVEL CONVERSION
1-of-8 DECODER
7416
M62320FP
CHIP SELECT
I²C BUS TRANSCEIVER
SHIFT REG
DATA LATCHES
I/O PORT
7417
ST24C01B6
7418
74HC4094D
7419
74HC4094D
SRG8
7422
SAA6579T
RDS
ANTI-ALIASING FILTER
57 Khz BANDPASS (8th ORDER)
RECONSTRUCTION FILTER
OSCILLATOR AND DIVIDER
QUALITY BIT GENERATOR
CLOCKED COMPARATOR
COSTAS LOOP VARIABLE AND FIXED DIVIDER
BIPHASE SYMBOL DECODER
DIFFERENTIAL DECODER
REFERENCE VOLTAGE
CLOCK REGENERATION AND SYNC
TEST LOGIC AND OUTPUT SELECTOR SWITCH
DATA MEMORY (RAM)
PROGR MEMORY (ROM)
PROGRAM COUNTER
INTERRUPT CONTROLLER
16 BIT TIMER/COUNTER
8 BIT TIMER/COUNTER
SERIAL INTERFACES
CLOCK/TIMING CONTROLLER
VFT DRIVER CIRCUIT
8 BIT A/D-CONVERTER
DUBBING
REC
SURF
DSC
PERSONAL
HOLD
STROBE
VEC
DBB
PAN
MORE
ENTER
STDBY
TIMER
PROG
CD
TUNER
TAPE
SEARCH_UP
SEARCH_DWN
STOP
PLAY
PREV
NEXT
MAX_SOUND
2_DPL
DOLBY_B
RDS
NEWS (TEXT)
AUX
REV
TO CDC KEY
TO TUNER
VOL RE
TO STDBY PCB
TO TAPE MODULE
TO JOG DIAL
BC847B
1N4148
1N4003
CDC_LED1
CDC_LED2
CDC_LED3
I2C_DATA
I2C_CLK
TU_CE
TU_DATA
TU_CLK
STEREO
JOG_A
JOG_B
JOG_LED
LED_ON
PWRDWN
RESET

FRONT BOARD - VARIATIONS TABLE

Front Boards application

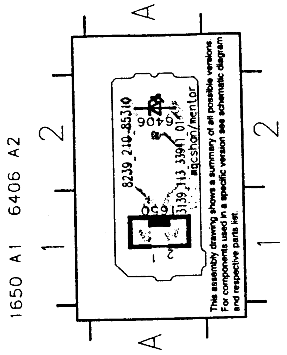
51420	FW830C/22/34 , FW840C/22
51810	FW870C/22 , FW878C/34
51820	FW870C/21 , FW878C/21/21M
51830	FW830C/37
51840	FW890P/21/30 , FW898W/21
51850	FW890P/22 , FW898W/34
51860	FW890P/37
52520	FW830C/21

Variations table for Front Board

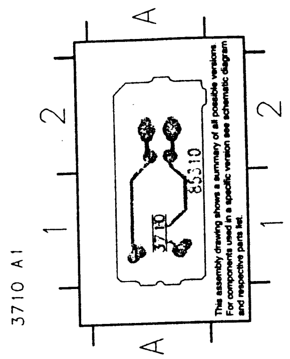
	51420	51810	51820	51830	51840	51850	51860	52520
16	x	x	-	x	-	x	x	-
1402	-	-	-	-	x	x	x	-
1403	x	x	-	-	-	x	-	-
1404	-	-	x	x	x	-	x	x
1405	-	x	-	-	x	x	-	-
1406	x	x	x	x	-	-	-	x
1408	-	-	-	-	x	x	x	-
1409	x	x	-	-	-	x	-	-
1410	x	x	-	-	x	x	-	-
1411	x	x	-	-	-	x	-	-
1483	x	x	-	x	-	x	x	-
2100	100pF	100pF	-	-	-	100pF	-	-
2101	82pF	82pF	-	-	-	82pF	-	-
2102	47pF	47pF	-	-	-	47pF	-	-
2107	100nF	100nF	-	-	-	100nF	-	-
2108	47pF	47pF	-	-	-	47pF	-	-
2109 , 2110	560pF	560pF	-	-	-	560pF	-	-
2111	2,2µF	2,2µF	-	-	-	2,2µF	-	-
3107	1k	1k	-	-	-	1k	-	-
3112	2k2	2k2	-	-	-	2k2	-	-
3113	220k	220k	-	-	-	220k	-	-
3114 , 3115	1k	1k	-	-	-	1k	-	-
3116 , 3117	-	-	47k	47k	47k	-	47k	47k
3657	10k	10k	10k	10k	-	-	-	10k
3659	-	-	-	-	1k	1k	1k	-
3660	12k	27k	820R	3k9	470R	27k	8k2	180R
3710	220R	220R	-	220R	-	220R	220R	-
3924	47k	-	47k	47k	-	-	47k	47k
5100 , 5402	x	x	-	-	-	x	-	-
6406	x	x	-	x	-	x	x	-
7422	x	x	-	-	-	x	-	-

x = Item in use.

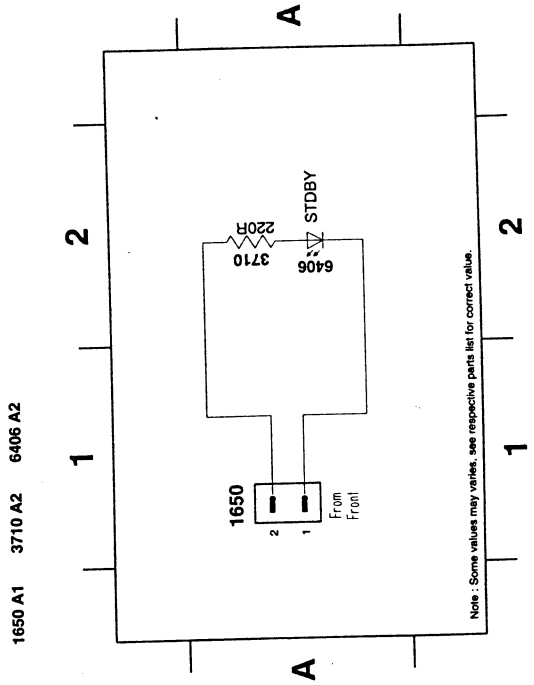
STANDBY LED BOARD - COMPONENT LAYOUT


1650 A1 6406 A2
A
1
2
8239 210 85310
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

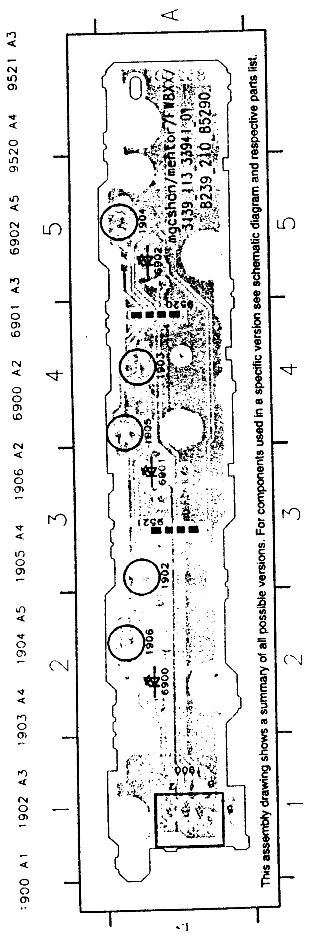
STANDBY LED BOARD - CHIP LAYOUT


3710 A1
A
1
2
3710
85310
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

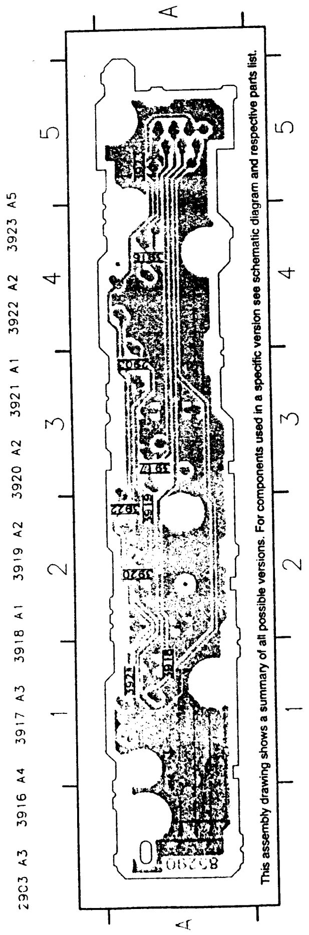
STANDBY LED PART - CIRCUIT DIAGRAM


1650 A1 3710 A2 6406 A2
A
1
2
1650
From Front
3710
220R
6406
STDBY
Note : Some values may varies, see respective parts list for correct value.

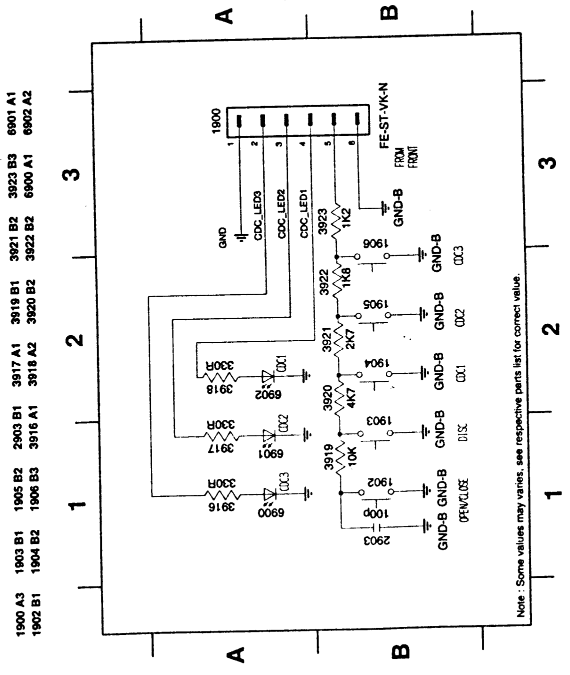
KEY-CDC BOARD - COMPONENT LAYOUT


1900 A1 1902 A3 1903 A4 1904 A5 1905 A4 1906 A2 6900 A2 6901 A3 6902 A5 9520 A4 9521 A3
A
1
2
3
4
5
8239 210 85290
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

KEY-CDC BOARD - CHIP LAYOUT

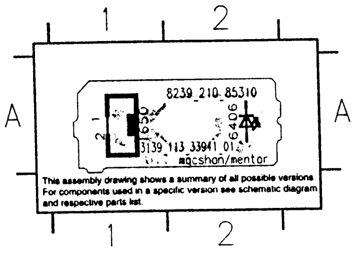

2903 A3 3916 A4 3917 A3 3918 A1 3919 A2 3920 A2 3921 A1 3922 A2 3923 A5
A
1
2
3
4
5
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

KEY-CDC PART - CIRCUIT DIAGRAM


1900 A3 1903 B1 1905 B2 2903 B1 3917 A1 3919 B1 3921 B2 3923 B3 6901 A1
1902 B1 1904 B2 1906 B3 3916 A1 3918 A2 3920 B2 3922 B2 6900 A1 6902 A2
A
B
1
2
3
1900
FE-ST-VK-N
FROM FRONT
GND
CDC_LED3
CDC_LED2
CDC_LED1
GND-B
3916
330R
3917
330R
3918
330R
6900
6901
6902
3919
10K
3920
4K7
3921
2K7
3922
1K8
3923
1K2
1902
1903
1904
1905
1906
2903
100p
CDC1
CDC2
CDC3
OPEN/CLOSE
Note : Some values may varies, see respective parts list for correct value.

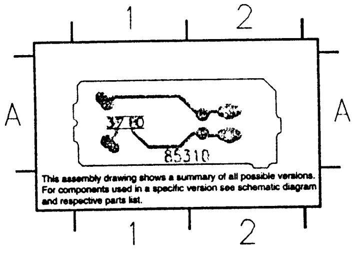
STANDBY LED BOARD - COMPONENT LAYOUT

1650 A1 6406 A2


1
2
A
A
8239_210_85310
1
2
1650
6406
3139 113 33941 01
mgcshon/mentor
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram
and respective parts list.
1
2

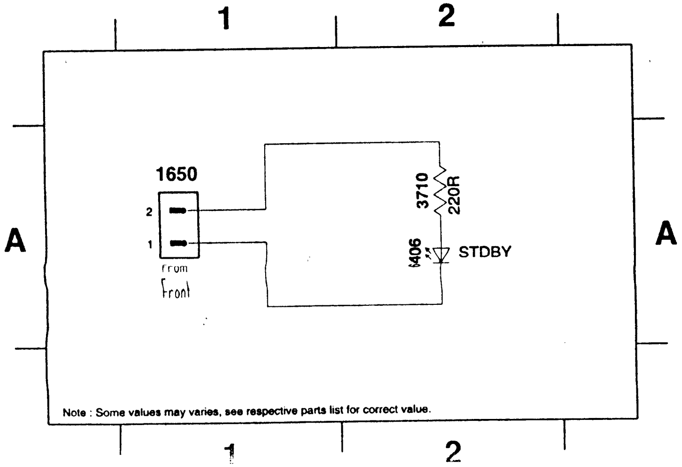
STANDBY LED BOARD - CHIP LAYOUT

3710 A1


1
2
A
A
3710
85310
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram
and respective parts list.
1
2

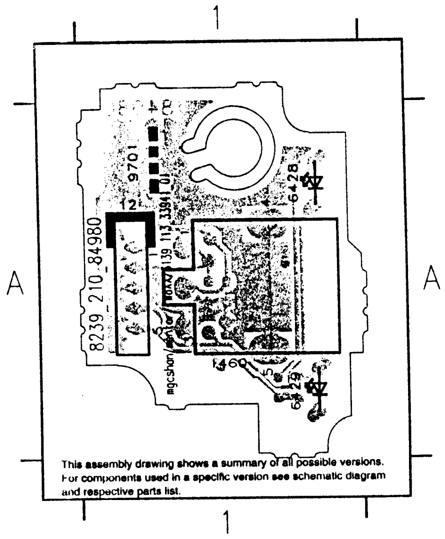
STANDBY LED PART - CIRCUIT DIAGRAM

1650 A1 3710 A2 6406 A2


1
2
A
A
1650
2
1
from
Front
3710
220R
6406
STDBY
Note : Some values may varies, see respective parts list for correct value.
1
2

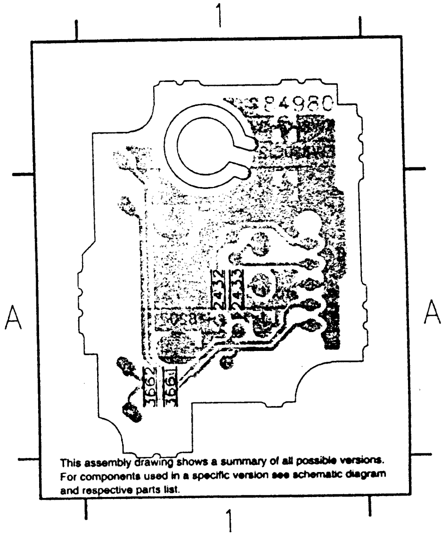
JOG ROTARY BOARD - COMPONENT LAYOUT

12 A1 6428 A1 9701 A1
1460 A1 6429 A1


1
A
A
9701
12
6428
8239_210_84980
3139_113_33941_01
mgcshon/mentor
1460
6429
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram
and respective parts list.
1

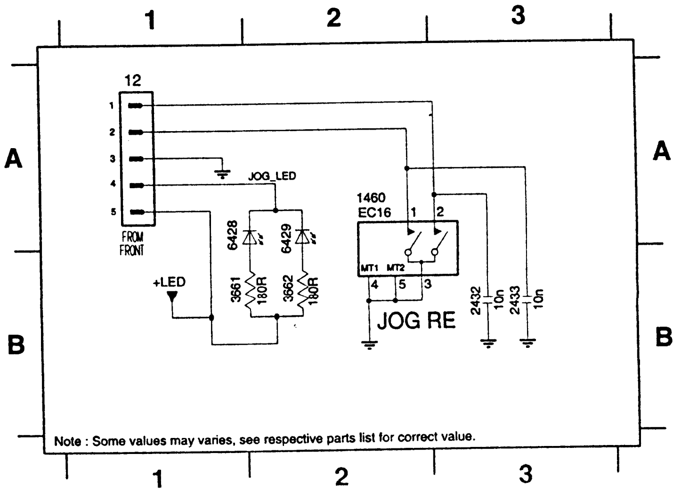
JOG ROTARY BOARD - CHIP LAYOUT

2432 A1 3661 A1
2433 A1 3662 A1

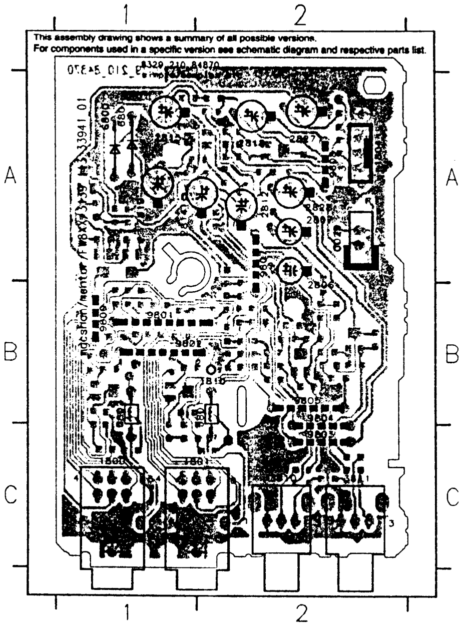

1
A
A
84980
2432
2433
3662
3661
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram
and respective parts list.
1

JOG ROTARY PART - CIRCUIT DIAGRAM

12 A1 1460 A2 2432 B3 2433 B3 3661 B1 3662 B2 6428 A1 6429 A2

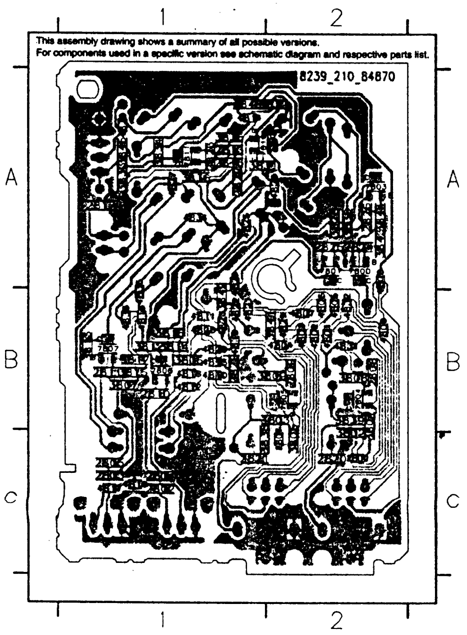

1
2
3
A
A
B
B
12
1
2
3
4
5
FROM
FRONT
JOG_LED
6428
6429
+LED
3661
180R
3662
180R
1460
EC16
1
2
MT1
MT2
4
5
3
JOG RE
2432
10n
2433
10n
Note : Some values may varies, see respective parts list for correct value.
1
2
3

KARAOKE BOARD - COMPONENT LAYOUT


1
2
A
B
C
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.
8239_210_84870
1800
1801
2806
2807
2812
2818
2819
2827
3810
3811
5801
5802
9800
9801
9802
9803
9804
9805
1810

0029	A2
1800	C1
1801	C1
1804	A2
1810	B2
2806	B2
2807	A2
2812	A2
2814	A1
2815	A1
2818	A2
2819	A1
2827	A2
2828	A2
3810	C2
3811	C2
5801	B2
5802	B1
6800	A1
6801	A1
9800	B1
9801	B1
9802	B1
9803	C2
9804	B2
9805	B2
9807	A2
9808	A2

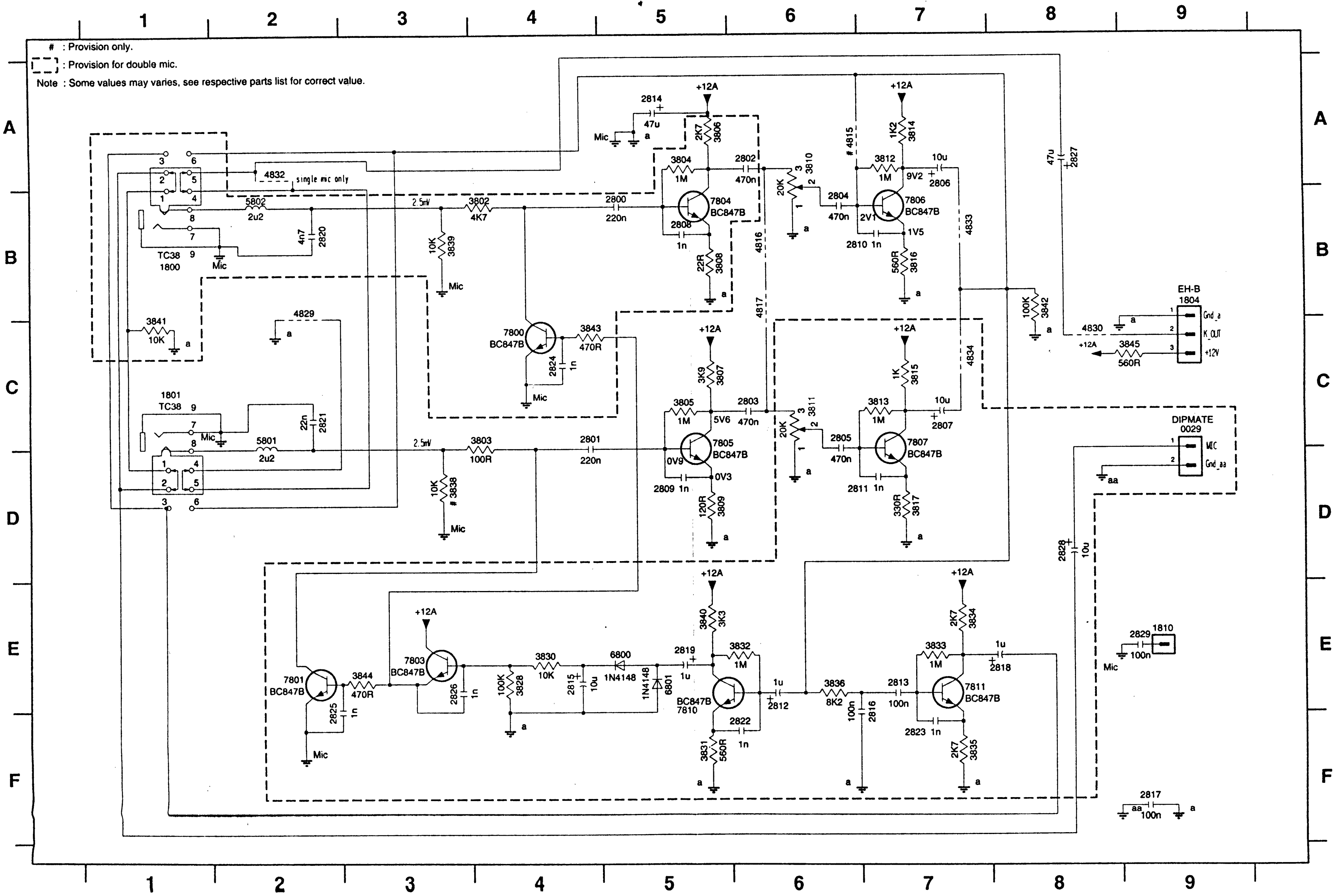
KARAOKE BOARD - CHIP LAYOUT


1
2
A
B
C
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.
8239_210_84870

2800	C2
2801	C2
2802	C1
2803	C1
2804	C1
2805	C1
2808	B2
2809	B2
2810	B1
2811	B1
2813	A1
2816	A1
2817	A1
2820	C2
2821	C1
2822	A1
2823	A1
2824	A2
2825	A2
2826	A2
2829	B1
3802	C2
3803	B2
3804	B2
3805	C2
3806	B1
3807	B1
3808	B2
3809	B2
3812	B1
3813	B1
3814	B1
3815	B1
3816	B1
3817	B1
3828	A2
3830	A2
3831	A1
3832	A2
3833	A1
3834	A1
3835	A1
3836	A1
3838	C1
3839	B2
3840	A1
3841	B2
3842	B1
3843	A2
3844	A2
3845	A1
4800	B2
4801	B2
4802	B2
4803	B2
4804	B2
4805	B2
4806	B2
4807	B2
4808	A2
4810	B1
4811	B1
4812	B1
4813	B1
4814	A1
4815	B1
4816	C1
4817	C1
4818	B1
4819	B1
4820	B1
4821	B1
4822	B1
4823	B1
4824	A1
4825	A1
4826	A2
4827	A1
4828	B1
4829	B2
4830	A1
4831	B2
4832	B2
4833	B1
4834	A1
4835	B1
7800	A2
7801	A2
7803	A2
7804	B2
7805	B2
7806	B1
7807	B1
7810	A1
7811	A1

KARAOKE PART - CIRCUIT DIAGRAM

0029	C9
1800	B1
1801	C1
1804	B9
1810	E9
2800	B5
2801	C4
2802	A6
2803	C6
2804	B6
2805	C6
2806	A7
2807	C7
2808	B5
2809	D5
2810	B6
2811	D6
2812	E6
2813	E7
2814	A5
2815	E4
2816	E7
2817	F9
2818	E8
2819	E5
2820	B2
2821	C2
2822	F6
2823	F7
2824	C4
2825	E2
2826	E3
2827	A8
2828	D8
2829	E9
3802	B4
3803	C4
3804	A5
3805	C5
3806	A5
3807	C5
3808	B5
3809	D5
3810	A6
3811	C6
3812	A7
3813	C7
3814	A7
3815	C7
3816	B7
3817	D7
3828	E4
3830	E4
3831	F5
3832	E6
3833	E7
3834	E7
3835	F7
3836	E6
3838	D3
3839	B3
3840	E5
3841	C1
3842	B8
3843	C4
3844	E3
3845	C9
4815	A6
4816	B6
4817	B6
4829	B2
4830	C8
4832	A2
4833	B7
4834	C7
5801	C2
5802	B2
6800	E5
6801	E5
7800	C4
7801	E2
7803	E3
7804	B5
7805	C5
7806	B7
7807	C7
7810	F5
7811	E7



: Provision only.

[ ] : Provision for double mic.

Note : Some values may varies, see respective parts list for correct value.

1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
TC38
1800
1801
Mic
4832
single mic only
5802
2u2
5801
2820
4n7
2821
22n
3841
10K
4829
2.5mV
3802
4K7
3803
100R
3839
10K
3838
# 3838
7800
BC847B
3843
470R
2824
1n
2814
47u
+12A
2K7
3806
3804
1M
2802
470n
2800
220n
7804
BC847B
2808
1n
22R
3808
4816
4817
3810
20K
2804
470n
# 4815
1K2
3814
3812
1M
9V2
10u
2806
7806
2V1
1V5
2810 1n
560R
3816
4833
47u
2827
100K
3842
EH-B
1804
Gnd_a
K_OUT
+12V
4830
3845
560R
3K9
3807
3805
1M
5V6
2803
470n
2801
220n
7805
0V9
0V3
2809 1n
120R
3809
3811
2805
470n
1K
3815
3813
1M
2807
7807
2811 1n
330R
3817
4834
DIPMATE
0029
MIC
Gnd_aa
aa
2828
10u
7801
3844
470R
2825
1n
7803
2826
1n
100K
3828
3830
10K
2815
10u
6800
1N4148
6801
3840
3K3
2819
1u
3832
1M
7810
2812
2822
1n
3831
560R
3836
8K2
2816
100n
2813
100n
3833
1M
2K7
3834
7811
2818
2823 1n
2K7
3835
2829
1810
100n
2817
100n
a

MISCELLANEOUS

1399	4822 267 10953	Flex Connector 7P
1401	4822 265 11207	Flex Connector 6P
1406	4822 265 11545	Flex Connector 19P
1407	4822 276 13775	Tact Switch
1408	4822 276 13775	Tact Switch
1412	4822 276 13775	Tact Switch
1413	4822 276 13775	Tact Switch
1414	4822 276 13775	Tact Switch
1415	4822 276 13775	Tact Switch
1416	4822 276 13775	Tact Switch
1417	4822 276 13775	Tact Switch
1418	4822 276 13775	Tact Switch
1419	4822 276 13775	Tact Switch
1420	4822 276 13775	Tact Switch
1421	4822 276 13775	Tact Switch
1422	4822 276 13775	Tact Switch
1423	4822 276 13775	Tact Switch
1424	4822 276 13775	Tact Switch
1425	4822 276 13775	Tact Switch
1426	4822 276 13775	Tact Switch
1427	4822 276 13775	Tact Switch
1428	4822 276 13775	Tact Switch
1429	4822 276 13775	Tact Switch
1430	4822 276 13775	Tact Switch
1431	4822 276 13775	Tact Switch
1432	4822 276 13775	Tact Switch
1433	4822 276 13775	Tact Switch
1434	4822 276 13775	Tact Switch
1435	4822 276 13775	Tact Switch
1436	4822 276 13775	Tact Switch
1437	4822 276 13775	Tact Switch
1460	4822 273 10371	Rotary Encoder 24P
1476	4822 273 10365	Rotary Encoder 24P
1480	4822 135 00272	FTD Display
1801	4822 265 11529	Headphone Socket
1900	4822 265 11207	Flex Connector 6P
1902	4822 276 13775	Tact Switch
1903	4822 276 13775	Tact Switch
1904	4822 276 13775	Tact Switch
1905	4822 276 13775	Tact Switch
1906	4822 276 13775	Tact Switch

CAPACITORS

2103	5322 122 32531	100pF 5% 50V
2104	5322 122 32531	100pF 5% 50V
2105	5322 122 32531	100pF 5% 50V
2106	5322 122 32531	100pF 5% 50V
2400	5322 122 32531	100pF 5% 50V
2401	5322 122 32531	100pF 5% 50V
2402	5322 122 32531	100pF 5% 50V
2403	5322 122 32531	100pF 5% 50V
2405	5322 122 32531	100pF 5% 50V
2406	5322 122 32531	100pF 5% 50V
2407	5322 122 32531	100pF 5% 50V
2408	5322 122 32531	100pF 5% 50V
2409	5322 122 32531	100pF 5% 50V
2410	5322 122 32531	100pF 5% 50V
2411	5322 122 32531	100pF 5% 50V
2412	5322 122 32531	100pF 5% 50V
2413	5322 122 32531	100pF 5% 50V
2414	5322 122 32531	100pF 5% 50V
2415	5322 122 32531	100pF 5% 50V
2416	5322 122 32531	100pF 5% 50V
2417	5322 122 32531	100pF 5% 50V
2418	5322 122 32531	100pF 5% 50V
2419	5322 122 32531	100pF 5% 50V
2420	5322 122 32531	100pF 5% 50V
2421	5322 122 32531	100pF 5% 50V
2429	5322 122 32531	100pF 5% 50V
2431	5322 122 32531	100pF 5% 50V
2432	4822 122 33177	10nF 20% 50V
2433	4822 122 33177	10nF 20% 50V
2464	4822 126 13196	100nF 10% 25V
2465	4822 126 10002	100nF 20% 25V
2466	4822 124 81286	47µF 20% 16V
2467	4822 126 13196	100nF 10% 25V
2468	4822 124 81286	47µF 20% 16V
2469	5322 122 32658	22pF 5% 50V
2470	5322 122 32658	22pF 5% 50V
2471	5322 122 32658	22pF 5% 50V
2472	4822 122 33216	270pF 5% 50V
2473	4822 126 13486	15pF 2% 63V
2474	4822 126 13836	1µF 16V
2475	4822 126 13836	1µF 16V
2476	4822 122 33175	2,2nF 20% 50V
2477	4822 126 13061	220nF 20% 25V
2478	4822 126 12105	33nF 5% 50V
2479	4822 122 33806	820pF 10% 63V
2480	4822 126 13482	470nF +80/-20% 16V
2481	4822 122 33797	47nF 20% 50V
2482	4822 126 13061	220nF 20% 25V
2483	4822 126 13836	1µF 16V
2484	4822 122 33177	10nF 20% 50V
2485	4822 126 13061	220nF 20% 25V
2486	4822 126 13061	220nF 20% 25V
2490	4822 122 33797	47nF 20% 50V
2491	4822 122 33175	2,2nF 20% 50V
2492	4822 126 13196	100nF 10% 25V
2493	4822 122 33177	10nF 20% 50V
2494	4822 122 33177	10nF 20% 50V
2495	4822 122 33177	10nF 20% 50V
2496	4822 122 33177	10nF 20% 50V

2497	4822 124 81286	47µF 20% 16V
2498	4822 126 13473	220nF +80/-20% 50V
2499	4822 126 13196	100nF 10% 25V
2500	4822 126 13473	220nF +80/-20% 50V
2501	4822 126 13196	100nF 10% 25V
2502	4822 126 13196	100nF 10% 25V
2503	5322 122 32448	10pF 5% 63V
2504	5322 122 32448	10pF 5% 63V
2505	5322 122 32531	100pF 5% 50V
2506	5322 122 32531	100pF 5% 50V
2507	5322 122 32531	100pF 5% 50V
2508	4822 126 12785	47nF 50V
2509	4822 126 13751	47nF 10% 63V
2600	4822 126 13196	100nF 10% 25V
2601	4822 126 13196	100nF 10% 25V
2701	5322 122 32531	100pF 5% 50V
2702	5322 122 32531	100pF 5% 50V
2703	5322 122 32531	100pF 5% 50V
2801	4822 126 13061	220nF 20% 25V
2803	4822 126 13482	470nF +80/-20% 16V
2804	4822 126 13482	470nF +80/-20% 16V
2806	4822 124 41579	10µF 20% 50V
2809	5322 122 34123	1nF 10% 50V
2810	5322 122 34123	1nF 10% 50V
2814	4822 124 40433	47µF 20% 25V
2817	4822 126 13196	100nF 10% 25V
2821	5322 122 32654	22nF 10% 63V
2827	4822 124 40433	47µF 20% 25V
2829	4822 126 13838	100nF +80/-20% 50V
2900	5322 122 32531	100pF 5% 50V
2901	5322 122 32531	100pF 5% 50V
2902	5322 122 32531	100pF 5% 50V
2903	5322 122 32531	100pF 5% 50V
2904	4822 126 13692	47pF 1% 63V
2905	4822 126 13692	47pF 1% 63V
2906	4822 126 13692	47pF 1% 63V
2907	4822 126 13692	47pF 1% 63V

RESISTORS

3100	4822 051 10102	1k 2% 0,25W
3101	4822 051 10102	1k 2% 0,25W
3102	4822 051 10102	1k 2% 0,25W
3103	4822 050 11002	1k 1% 0,4W
3104	4822 117 10833	10k 1% 0,1W
3105	4822 117 10833	10k 1% 0,1W
3106	4822 117 10833	10k 1% 0,1W
3108	4822 051 10102	1k 2% 0,25W
3109	4822 051 10102	1k 2% 0,25W
3110	4822 051 10102	1k 2% 0,25W
3111	4822 051 10102	1k 2% 0,25W
3116	4822 117 10834	47k 1% 0,1W
3117	4822 117 10834	47k 1% 0,1W
3400	4822 117 11149	82k 1% 0,1W
3401	4822 117 11149	82k 1% 0,1W
3402	4822 117 11149	82k 1% 0,1W
3403	4822 117 11149	82k 1% 0,1W
3404	4822 051 10102	1k 2% 0,25W
3405	4822 051 10102	1k 2% 0,25W
3406	4822 051 10102	1k 2% 0,25W
3407	4822 051 10102	1k 2% 0,25W
3408	4822 051 10102	1k 2% 0,25W
3409	4822 051 10102	1k 2% 0,25W
3411	4822 117 11149	82k 1% 0,1W
3412	4822 117 11149	82k 1% 0,1W
3413	4822 117 11149	82k 1% 0,1W
3414	4822 051 20008	0R Jumper 0805
3415	4822 051 20008	0R Jumper 0805
3420	4822 117 11149	82k 1% 0,1W
3440	4822 117 11454	820R 1% 0,1W
3441	4822 051 20561	560R 5% 0,1W
3442	4822 051 20391	390R 5% 0,1W
3443	4822 117 11504	270R 1% 0,1W
3444	4822 117 11503	220R 1% 0,1W
3445	4822 117 10353	150R 1% 0,1W
3446	4822 050 11002	1k 1% 0,4W
3450	4822 117 12955	2k7 1% 0,1W
3463	4822 117 10833	10k 1% 0,1W
3464	4822 051 20472	4k7 5% 0,1W
3465	4822 117 12955	2k7 1% 0,1W
3466	4822 051 20182	1k8 5% 0,1W
3467	4822 051 20122	1k2 5% 0,1W
3468	4822 117 11454	820R 1% 0,1W
3469	4822 051 20561	560R 5% 0,1W
3470	4822 051 20391	390R 5% 0,1W
3471	4822 117 11504	270R 1% 0,1W
3472	4822 116 83872	220R 5% 0,5W
3473	4822 117 10353	150R 1% 0,1W
3474	4822 051 10102	1k 2% 0,25W
3480	4822 117 12955	2k7 1% 0,1W
3483	4822 117 10833	10k 1% 0,1W
3484	4822 051 20472	4k7 5% 0,1W
3485	4822 117 12955	2k7 1% 0,1W
3486	4822 051 20182	1k8 5% 0,1W
3487	4822 051 20122	1k2 5% 0,1W
3488	4822 117 11454	820R 1% 0,1W
3489	4822 051 20561	560R 5% 0,1W
3490	4822 051 20391	390R 5% 0,1W
3491	4822 117 11504	270R 1% 0,1W
3492	4822 117 11503	220R 1% 0,1W
3493	4822 116 83868	150R 5% 0,5W
3494	4822 050 11002	1k 1% 0,4W
3504	4822 116 52263	2k7 5% 0,5W

3563	4822 051 10102
3564	4822 051 10102
3565	4822 051 10102
3566	4822 051 10102
3567	4822 051 10102
3568	4822 051 10102
3569	4822 051 10102
3570	4822 051 10102
3571	4822 051 10102
3572	4822 051 10102
3573	4822 051 10102
3574	4822 051 10102
3575	4822 051 10102
3576	4822 051 10102
3577	4822 051 10102
3578	4822 051 10102
3579	4822 051 10102
3580	4822 051 10102
3581	4822 051 10102
3582	4822 051 10102
3583	4822 051 10102
3584	4822 051 10102
3585	4822 051 10102
3586	4822 051 10102
3587	4822 051 10102
3588	4822 051 10102
3589	4822 051 10102
3590	4822 051 10102
3591	4822 051 10102
3592	4822 051 10102
3593	4822 051 10102
3594	4822 051 10102
3595	4822 051 10102
3596	4822 051 10102
3597	4822 051 10102
3599	4822 116 52234
3600	4822 051 10102
3601	4822 051 10102
3602	4822 050 11002
3603	4822 051 20105
3604	4822 051 10102
3605	4822 051 10102
3606	4822 051 10102
3607	4822 117 10833
3608	4822 051 20472
3609	4822 051 10102
3610	4822 051 10102
3611	4822 117 10833
3612	4822 117 10833
3613	4822 051 10102
3614	4822 051 10102

3563	4822 051 10102	1k 2% 0,25W
3564	4822 051 10102	1k 2% 0,25W
3565	4822 051 10102	1k 2% 0,25W
3566	4822 051 10102	1k 2% 0,25W
3567	4822 051 10102	1k 2% 0,25W
3568	4822 051 10102	1k 2% 0,25W
3569	4822 051 10102	1k 2% 0,25W
3570	4822 051 10102	1k 2% 0,25W
3571	4822 051 10102	1k 2% 0,25W
3572	4822 051 10102	1k 2% 0,25W
3573	4822 051 10102	1k 2% 0,25W
3574	4822 051 10102	1k 2% 0,25W
3575	4822 051 10102	1k 2% 0,25W
3576	4822 051 10102	1k 2% 0,25W
3577	4822 051 10102	1k 2% 0,25W
3578	4822 051 10102	1k 2% 0,25W
3579	4822 051 10102	1k 2% 0,25W
3580	4822 051 10102	1k 2% 0,25W
3581	4822 051 10102	1k 2% 0,25W
3582	4822 051 10102	1k 2% 0,25W
3583	4822 051 10102	1k 2% 0,25W
3584	4822 051 10102	1k 2% 0,25W
3585	4822 051 10102	1k 2% 0,25W
3586	4822 051 10102	1k 2% 0,25W
3587	4822 051 10102	1k 2% 0,25W
3588	4822 051 10102	1k 2% 0,25W
3589	4822 051 10102	1k 2% 0,25W
3590	4822 051 10102	1k 2% 0,25W
3591	4822 051 10102	1k 2% 0,25W
3592	4822 051 10102	1k 2% 0,25W
3593	4822 051 10102	1k 2% 0,25W
3594	4822 051 10102	1k 2% 0,25W
3595	4822 051 10102	1k 2% 0,25W
3596	4822 051 10102	1k 2% 0,25W
3597	4822 051 10102	1k 2% 0,25W
3599	4822 116 52234	100k 5% 0,5W
3600	4822 051 10102	1k 2% 0,25W
3601	4822 051 10102	1k 2% 0,25W
3602	4822 050 11002	1k 1% 0,4W
3603	4822 051 20105	1M 5% 0,1W
3604	4822 051 10102	1k 2% 0,25W
3605	4822 051 10102	1k 2% 0,25W
3606	4822 051 10102	1k 2% 0,25W
3607	4822 117 10833	10k 1% 0,1W
3608	4822 051 20472	4k7 5% 0,1W
3609	4822 051 10102	1k 2% 0,25W
3610	4822 051 10102	1k 2% 0,25W
3611	4822 117 10833	10k 1% 0,1W
3612	4822 117 10833	10k 1% 0,1W
3613	4822 051 10102	1k 2% 0,25W
3614	4822 051 10102	1k 2% 0,25W
3615	4822 050 11002	1k 1% 0,4W
3616	4822 050 11002	1k 1% 0,4W
3618	4822 051 20684	680k 5% 0,1W
3619	4822 117 11139	1k5 1% 0,1W
3620	4822 051 20474	470k 5% 0,1W
3621	4822 117 10834	47k 1% 0,1W
3622	4822 051 20684	680k 5% 0,1W
3623	4822 117 11139	1k5 1% 0,1W
3624	4822 051 20474	470k 5% 0,1W
3625	4822 117 10834	47k 1% 0,1W
3626	4822 051 20684	680k 5% 0,1W
3627	4822 117 11139	1k5 1% 0,1W
3628	4822 051 20474	470k 5% 0,1W
3629	4822 117 10834	47k 1% 0,1W
3630	4822 051 20684	680k 5% 0,1W
3631	4822 117 11139	1k5 1% 0,1W
3632	4822 051 20474	470k 5% 0,1W
3633	4822 117 10834	47k 1% 0,1W
3634	4822 117 10833	10k 1% 0,1W
3638	4822 051 20101	100R 5% 0,1W
3639	4822 117 10833	10k 1% 0,1W
3640	4822 051 10102	1k 2% 0,25W
3641	4822 051 10102	1k 2% 0,25W
3643	4822 051 20104	100k 5% 0,1W
3644	4822 117 10833	10k 1% 0,1W
3645	4822 117 10833	10k 1% 0,1W
3656	4822 051 10102	1k 2% 0,25W
3657	4822 117 10833	10k 1% 0,1W
3658	4822 117 12955	2k7 1% 0,1W
3660	4822 117 11448	180R 1% 0,1W /21
3660	4822 051 20392	3k9 5% 0,1W /37
3661	4822 117 11448	180R 1% 0,1W
3662	4822 117 11448	180R 1% 0,1W
3663	4822 117 11448	180R 1% 0,1W
3664	4822 117 11448	180R 1% 0,1W
3665	4822 117 11448	180R 1% 0,1W
3666	4822 117 11448	180R 1% 0,1W
3667	4822 117 10353	150R 1% 0,1W
3668	4822 051 10102	1k 2% 0,25W
3669	4822 051 20569	56R 5% 0,1W
3670	4822 117 10353	150R 1% 0,1W
3671	4822 051 20569	56R 5% 0,1W
3672	4822 051 10102	1k 2% 0,25W
3673	4822 117 11448	180R 1% 0,1W
3674	4822 116 52213	180R 5% 0,1W
3675	4822 116 52213	180R 5% 0,1W
3676	4822 117 11503	220R 1% 0,1W
3677	4822 117 11503	220R 1% 0,1W
3678	4822 117 11503	220R 1% 0,1W
3679	4822 117 11503	220R 1% 0,1W
3680	4822 051 10102	1k 2% 0,25W

ELECTRICAL PARTS LIST - FRONT BOARD

RESISTORS

3681	4822 050 11002	1k 1% 0,4W
3682	4822 116 52272	330k 5% 0,5W
3683	4822 117 11503	220R 1% 0,1W
3684	4822 117 11503	220R 1% 0,1W
3686	4822 117 10833	10k 1% 0,1W
3700	4822 051 20101	100R 5% 0,1W
3701	4822 051 20101	100R 5% 0,1W
3702	4822 117 10833	10k 1% 0,1W
3703	4822 117 10833	10k 1% 0,1W
3704	4822 117 10833	10k 1% 0,1W
3705	4822 051 10102	1k 2% 0,25W
3706	4822 051 10102	1k 2% 0,25W
3707	4822 051 10102	1k 2% 0,25W
3708	4822 117 10833	10k 1% 0,1W
3709	4822 117 10833	10k 1% 0,1W
3710	4822 117 11503	220R 1% 0,1W
3803	4822 051 20101	100R 5% 0,1W
3805	4822 051 20105	1M 5% 0,1W
3807	4822 051 20392	3k9 5% 0,1W
3809	4822 051 20121	120R 5% 0,1W
3810	4822 101 21204	20kA POTM
3812	4822 051 20105	1M 5% 0,1W
3814	4822 051 20122	1k2 5% 0,1W
3816	4822 051 20561	560R 5% 0,1W
3842	4822 051 20104	100k 5% 0,1W
3845	4822 051 20008	0R Jumper 0805
3900	4822 051 10102	1k 2% 0,25W
3901	4822 051 10102	1k 2% 0,25W
3902	4822 051 10102	1k 2% 0,25W
3903	4822 051 10102	1k 2% 0,25W
3904	4822 051 10102	1k 2% 0,25W
3905	4822 051 10102	1k 2% 0,25W
3906	4822 051 10102	1k 2% 0,25W
3907	4822 051 10102	1k 2% 0,25W
3908	4822 051 10102	1k 2% 0,25W
3909	4822 051 20471	470R 5% 0,1W
3910	4822 051 20471	470R 5% 0,1W
3911	4822 051 20471	470R 5% 0,1W
3912	4822 051 20471	470R 5% 0,1W
3913	4822 116 83883	470R 5% 0,5W
3914	4822 116 83883	470R 5% 0,5W
3915	4822 051 10102	1k 2% 0,25W
3916	4822 051 20331	330R 5% 0,1W
3917	4822 051 20331	330R 5% 0,1W
3918	4822 051 20331	330R 5% 0,1W
3919	4822 117 10833	10k 1% 0,1W
3920	4822 051 20472	4k7 5% 0,1W
3921	4822 117 12955	2k7 1% 0,1W
3922	4822 051 20182	1k8 5% 0,1W
3923	4822 051 20122	1k2 5% 0,1W
3924	4822 117 10834	47k 1% 0,1W

4401	4822 051 20008	0R Jumper 0805
4402	4822 051 20008	0R Jumper 0805
4403	4822 051 20008	0R Jumper 0805
4404	4822 051 20008	0R Jumper 0805
4405	4822 051 20008	0R Jumper 0805
4406	4822 051 20008	0R Jumper 0805
4407	4822 051 20008	0R Jumper 0805
4408	4822 051 20008	0R Jumper 0805
4409	4822 051 20008	0R Jumper 0805
4410	4822 051 20008	0R Jumper 0805
4411	4822 051 20008	0R Jumper 0805
4412	4822 051 20008	0R Jumper 0805
4413	4822 051 20008	0R Jumper 0805
4414	4822 051 20008	0R Jumper 0805
4415	4822 051 20008	0R Jumper 0805
4416	4822 051 20008	0R Jumper 0805
4417	4822 051 20008	0R Jumper 0805
4418	4822 051 20008	0R Jumper 0805
4419	4822 051 20008	0R Jumper 0805
4420	4822 051 20008	0R Jumper 0805
4421	4822 051 20008	0R Jumper 0805
4422	4822 051 20008	0R Jumper 0805
4423	4822 051 20008	0R Jumper 0805
4424	4822 051 20008	0R Jumper 0805
4425	4822 051 20008	0R Jumper 0805
4426	4822 051 20008	0R Jumper 0805
4427	4822 051 20008	0R Jumper 0805
4428	4822 051 20008	0R Jumper 0805
4429	4822 051 20008	0R Jumper 0805
4430	4822 051 20008	0R Jumper 0805
4431	4822 051 20008	0R Jumper 0805
4432	4822 051 20008	0R Jumper 0805
4433	4822 051 20008	0R Jumper 0805
4434	4822 051 20008	0R Jumper 0805
4435	4822 051 20008	0R Jumper 0805
4436	4822 051 20008	0R Jumper 0805
4437	4822 051 20008	0R Jumper 0805
4438	4822 051 20008	0R Jumper 0805
4439	4822 051 20008	0R Jumper 0805
4440	4822 051 20008	0R Jumper 0805
4441	4822 051 20008	0R Jumper 0805
4442	4822 051 20008	0R Jumper 0805
4443	4822 051 20008	0R Jumper 0805
4444	4822 051 20008	0R Jumper 0805
4445	4822 051 20008	0R Jumper 0805
4446	4822 051 20008	0R Jumper 0805
4447	4822 051 20008	0R Jumper 0805
4448	4822 051 20008	0R Jumper 0805
4449	4822 051 20008	0R Jumper 0805
4450	4822 051 20008	0R Jumper 0805
4451	4822 051 20008	0R Jumper 0805

ELECTRICAL PARTS LIST - FRONT BOARD

4452	4822 051 20008	0R Jumper 0805
4453	4822 051 20008	0R Jumper 0805
4454	4822 051 20008	0R Jumper 0805
4455	4822 051 20008	0R Jumper 0805
4456	4822 051 20008	0R Jumper 0805
4457	4822 051 20008	0R Jumper 0805
4458	4822 051 20008	0R Jumper 0805
4459	4822 051 20008	0R Jumper 0805
4460	4822 051 20008	0R Jumper 0805
4461	4822 051 20008	0R Jumper 0805
4462	4822 051 20008	0R Jumper 0805
4463	4822 051 20008	0R Jumper 0805
4464	4822 051 20008	0R Jumper 0805
4465	4822 051 20008	0R Jumper 0805
4466	4822 051 20008	0R Jumper 0805
4467	4822 051 20008	0R Jumper 0805
4468	4822 051 20008	0R Jumper 0805
4469	4822 051 20008	0R Jumper 0805
4470	4822 051 20008	0R Jumper 0805
4471	4822 051 20008	0R Jumper 0805
4472	4822 051 20008	0R Jumper 0805
4476	4822 051 20008	0R Jumper 0805
4479	4822 051 20008	0R Jumper 0805
4800	4822 051 20008	0R Jumper 0805
4801	4822 051 20008	0R Jumper 0805
4802	4822 051 20008	0R Jumper 0805
4803	4822 051 20008	0R Jumper 0805
4804	4822 051 20008	0R Jumper 0805
4805	4822 051 20008	0R Jumper 0805
4806	4822 051 20008	0R Jumper 0805
4807	4822 051 20008	0R Jumper 0805
4808	4822 051 20008	0R Jumper 0805
4809	4822 051 20008	0R Jumper 0805
4810	4822 051 20008	0R Jumper 0805
4811	4822 051 20008	0R Jumper 0805
4812	4822 051 20008	0R Jumper 0805
4813	4822 051 20008	0R Jumper 0805
4814	4822 051 20008	0R Jumper 0805
4816	4822 051 20008	0R Jumper 0805
4817	4822 051 20008	0R Jumper 0805
4818	4822 051 20008	0R Jumper 0805
4819	4822 051 20008	0R Jumper 0805
4820	4822 051 20008	0R Jumper 0805
4821	4822 051 20008	0R Jumper 0805
4822	4822 051 20008	0R Jumper 0805
4823	4822 051 20008	0R Jumper 0805
4824	4822 051 20008	0R Jumper 0805
4825	4822 051 20008	0R Jumper 0805
4826	4822 051 20008	0R Jumper 0805
4827	4822 051 20008	0R Jumper 0805
4828	4822 051 20008	0R Jumper 0805

4829	4822 051 20008	0R Jumper 0805
4830	4822 051 20008	0R Jumper 0805
4831	4822 051 20008	0R Jumper 0805
4832	4822 051 20008	0R Jumper 0805
4833	4822 051 20008	0R Jumper 0805
4835	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5400	5322 242 73686	Ceramic Resonator
5401	4822 242 70938	X'tal Resonator 32,768kHz
5403	4822 157 62552	Coil 2,2µH 5%
5404	4822 157 62552	Coil 2,2µH 5%
5405	4822 157 52333	Coil 100µH 5%
5406	4822 157 52333	Coil 100µH 5%
5408	4822 157 71593	Coil 10µH 10%
5409	4822 157 71593	Coil 10µH 10%
5410	4822 157 52333	Coil 100µH 5%
5801	4822 157 62552	Coil 2,2µH 5%

DIODES

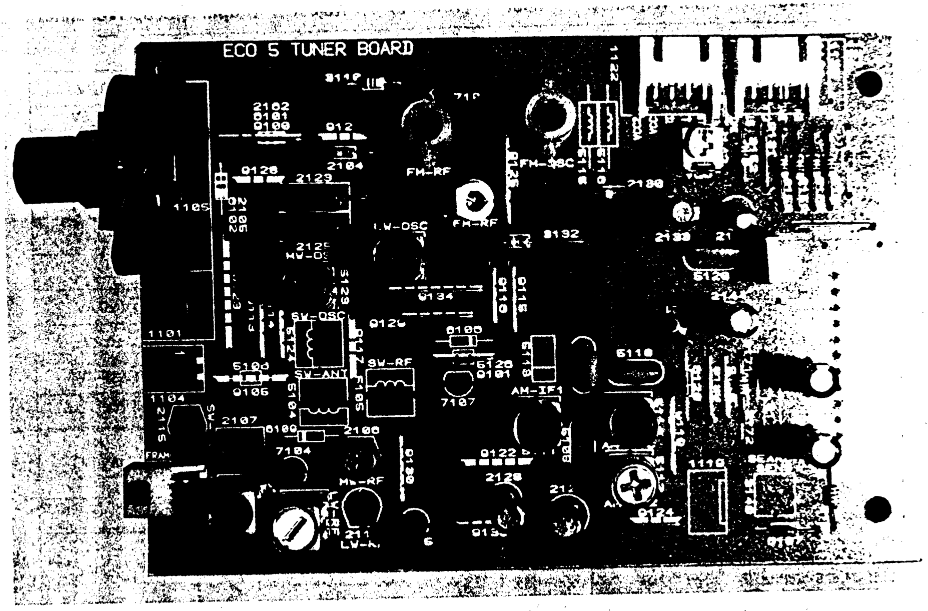
6404	4822 130 31878	1N4003G
6405	4822 130 31878	1N4003G
6406	4822 130 10792	LTL-1CHPE
6420	4822 130 30621	1N4148
6422	4822 130 30621	1N4148
6423	4822 130 30621	1N4148
6425	4822 130 30621	1N4148
6426	4822 130 30621	1N4148
6427	4822 130 31878	1N4003G
6428	4822 130 11589	LTL-1CHAE
6429	4822 130 11589	LTL-1CHAE
6430	4822 130 11589	LTL-1CHAE
6431	4822 130 11589	LTL-1CHAE
6432	4822 130 11589	LTL-1CHAE
6433	4822 130 11589	LTL-1CHAE
6434	4822 130 11589	LTL-1CHAE
6435	4822 130 11589	LTL-1CHAE
6436	4822 130 11589	LTL-1CHAE
6437	4822 130 11589	LTL-1CHAE
6438	4822 130 11589	LTL-1CHAE
6439	4822 130 11589	LTL-1CHAE
6440	4822 130 11589	LTL-1CHAE
6441	4822 130 11589	LTL-1CHAE
6442	4822 130 11589	LTL-1CHAE
6443	4822 130 10792	LTL-1CHPE
6444	4822 130 10792	LTL-1CHPE
6445	4822 130 10792	LTL-1CHPE
6446	4822 130 10792	LTL-1CHPE
6900	4822 130 10791	LTL-1CHGE
6901	4822 130 10791	LTL-1CHGE
6902	4822 130 10791	LTL-1CHGE

ELECTRICAL PARTS LIST - FRONT BOARD

TRANSISTORS & INTEGRATED CIRCUITS

7400	4822 130 60511	BC847B
7401	4822 130 60511	BC847B
7402	4822 130 60511	BC847B
7403	4822 130 60511	BC847B
7404	4822 130 60511	BC847B
7406	4822 130 60511	BC847B
7407	4822 130 60511	BC847B
7408	4822 130 60511	BC847B
7410	4822 130 10165	GP1U28XP
7411	4822 130 60511	BC847B
7412	4822 130 60511	BC847B
7413	4822 209 17387	TMP88CU74YF - '870S51891'
7415	5322 209 11446	HEF4051BT
7416	4822 209 17345	M62320FP
7417	4822 209 31508	ST24C01B6
7418	4822 209 15449	74HC4094D
7419	4822 209 15449	74HC4094D
7423	4822 130 60511	BC847B
7805	4822 130 60511	BC847B
7806	4822 130 60511	BC847B

Note : Only the parts mentioned in this list are normal service spare parts.



TUNER BOARD ECO5

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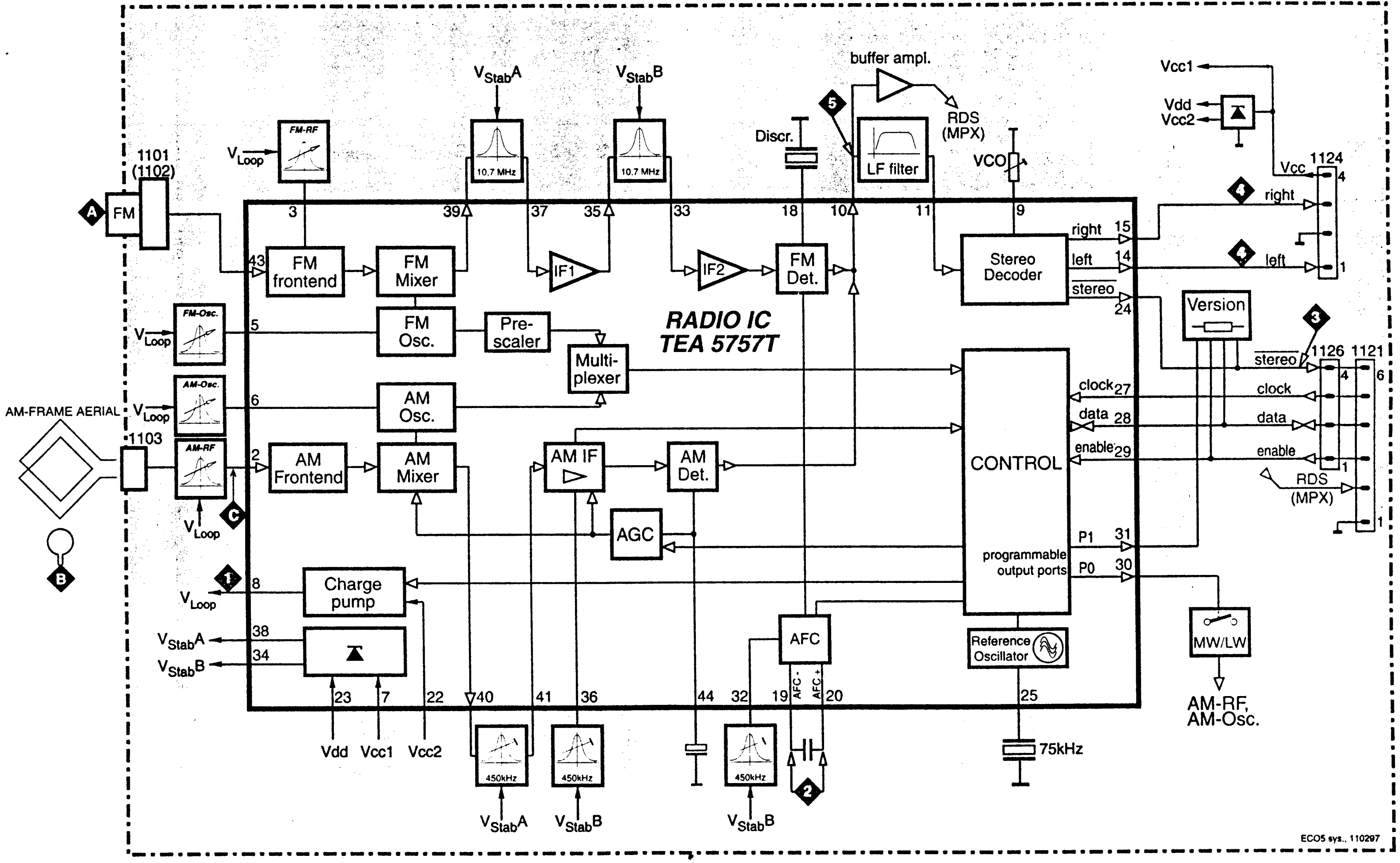
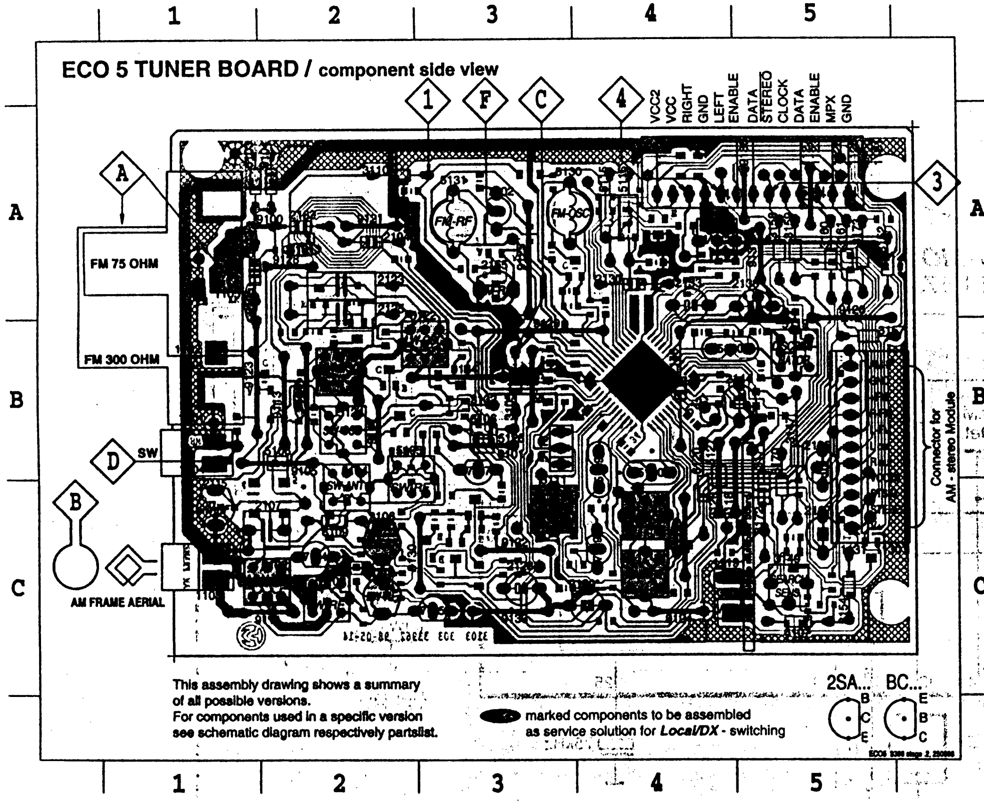
BLOCKDIAGRAM

TUNER BOARD
ECO 5 systems


FM
1101
(1102)
A
FM-RF
VLoop
VStabA
VStabB
10,7 MHz
10,7 MHz
buffer ampl.
5
RDS
(MPX)
Discr.
LF filter
VCO
Vcc1
Vdd
Vcc2
Vcc
1124
4
right
4
left
1
3
39
37
35
33
18
10
11
9
43
FM
frontend
FM
Mixer
IF1
IF2
FM
Det.
Stereo
Decoder
right 15
left 14
stereo
24
FM-Osc.
VLoop
5
FM
Osc.
Pre-
scaler
Multi-
plexer
RADIO IC
TEA 5757T
Version
3
stereo
1126
1121
4
6
AM-Osc.
AM-FRAME AERIAL
VLoop
6
AM
Osc.
clock 27
data 28
enable 29
clock
data
enable
1
1103
AM-RF
2
AM
Frontend
AM
Mixer
AM IF
AM
Det.
CONTROL
RDS
(MPX)
1
C
VLoop
AGC
P1 31
programmable
output ports
P0 30
B
1
8
VLoop
Charge
pump
MW/LW
VStabA 38
VStabB 34
AFC
Reference
Oscillator
AFC -
AFC +
23
7
22
40
41
36
44
32
19
20
25
Vdd
Vcc1
Vcc2
450kHz
450kHz
450kHz
75kHz
2
AM-RF,
AM-Osc.
VStabA
VStabB
VStabB
ECO5 sys., 110297

1101	A1	2106	C2	2137	C5	3149	C5	3173	A5	5114	C4	5130	A3	7104	C2	9117	B2	9129	B3
1102	A1	2107	C2	2138	A5	3152	A5	5102	C2	5115	A4	5131	A3	7105	C3	9118	B4	9130	C3
1103	C1	2110	C2	2144	B5	3154	C5	5103	C2	5116	A4	6101	A2	7107	B3	9119	C4	9131	A5
1104	B1	2115	C1	2148	B4	3157	B5	5104	C2	5119	B5	6102	A1	7119	C4	9120	B4	9133	C3
1105	A1	2123	A2	2155	A3	3158	A5	5105	B2	5120	B4	6103	A1	9100	A2	9121	A2	9134	B3
1119	C5	2125	A2	2162	A2	3159	A5	5106	B2	5121	B4	6104	A2	9101	B3	9122	C3	9136	A5
1120	A5	2128	C3	3105	B3	3160	A5	5109	B4	5122	B3	6106	B3	9105	B2	9123	B1	9137	A5
1130	B5	2129	C4	3110	A2	3161	A5	5110	B4	5123	B2	6107	C5	9111	C2	9124	C4		
1131	B5	2130	A4	3132	B3	3170	C5	5111	C3	5124	B2	6109	C2	9113	B2	9125	A3		
2104	A2	2133	A4	3142	A4	3171	C5	5112	C4	5126	B3	6120	C4	9114	B2	9126	B5		
2105	A1	2135	B5	3147	B5	3172	C5	5113	B3	5127	B4	7102	A3	9115	B3	9128	A2		

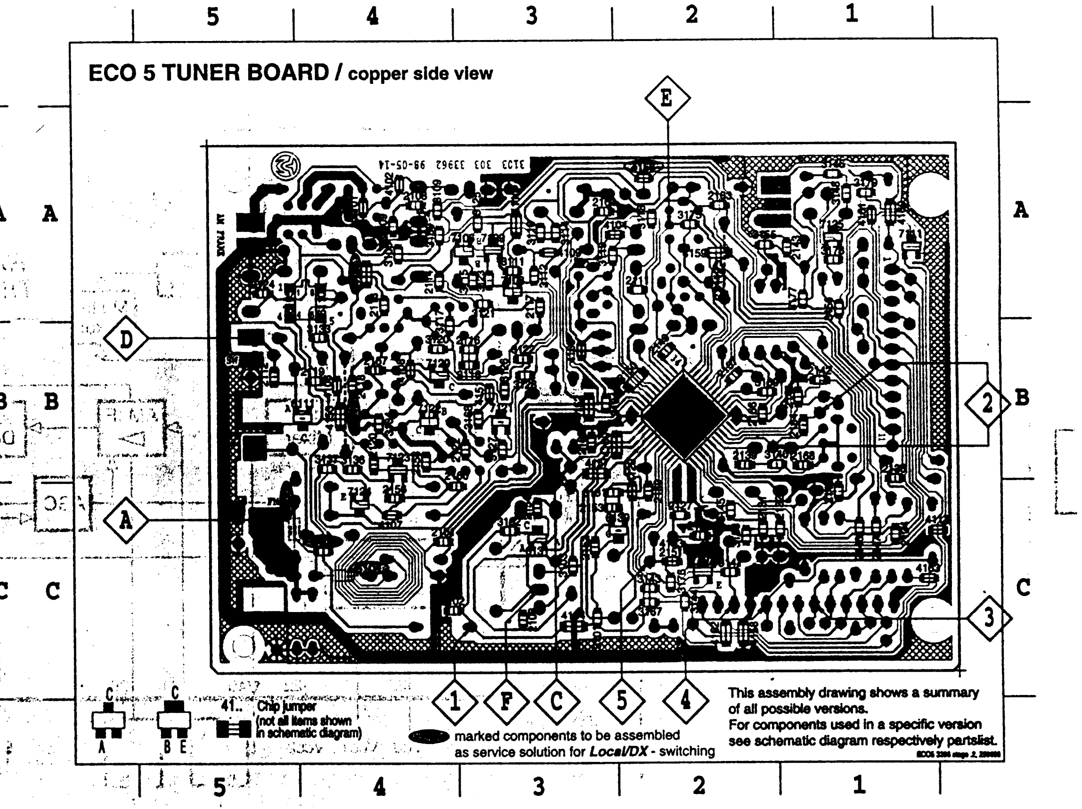

ECO 5 TUNER BOARD / component side view

1
2
3
4
5
A
B
C
1
F
C
4
VCC2
VCC
RIGHT
GND
LEFT
ENABLE
DATA
STEREO
CLOCK
DATA
ENABLE
MPX
GND
3
A
FM 75 OHM
FM 300 OHM
D
SW
B
AM FRAME AERIAL
FM-RF
FM-OSC
Connector for AM - stereo Module
2SA...
BC...
B
C
E
E
B
C

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

marked components to be assembled as service solution for *Local/DX* - switching

2101	C4	2118	B4	2139	B2	2153	C3	2166	B2	3112	A3	3123	A3	3143	C2	3175	A2	4105	B3	4153	B4	6105	A4	7120	B4
2102	C4	2119	B4	2141	B1	2154	C3	2167	B2	3113	A2	3125	A3	3144	C2	3176	C2	4106	B4	4154	C3	6110	A4	7121	B3
2103	C3	2120	B4	2142	B1	2156	C4	2168	B 1	3114	A3	3126	B3	3145	C2	3177	A1	4107	C4	4155	A4	6111	B4	7122	B4
2108	A4	2122	B3	2143	A1	2157	B4	3101	C3	3115	A3	3127	B3	3146	A1	3178	A1	4108	B4	4156	A2	6130	C2	7123	B4
2109	A4	2124	A5	2145	C1	2158	B4	3102	C3	3116	A3	3128	B3	3148	A1	3179	A1	4109	A3	4157	B3	6131	C3	7124	C4
2111	A2	2126	C2	2146	C1	2159	C2	3103	C3	3117	B4	3133	B4	3153	C2	3180	A4	4110	A3	4158	C2	7101	B2	7125	A1
2112	B5	2127	C2	2147	C1	2160	C4	3104	B3	3118	B3	3134	B4	3155	A2	3181	C3	4111	C1	4159	A2	7103	C2		
2113	A4	2131	C2	2149	B2	2161	A3	3106	C4	3119	A3	3136	B4	3156	A1	4101	A4	4120	C2	4160	A1	7106	A3		
2114	A4	2132	C1	2150	B2	2163	A2	3108	A4	3120	B4	3137	B4	3167	C2	4102	A4	4150	B2	4161	A1	7108	A3		
2116	B3	2134	C1	2151	C2	2164	B1	3109	A4	3121	A3	3140	B2	3168	B3	4103	C2	4151	B3	4162	C1	7109	A3		
2117	A3	2136	B1	2152	C3	2165	B3	3111	A3	3122	B3	3141	C2	3169	B2	4104	A2	4152	B3	4163	C1	7111	A1		

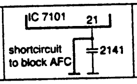
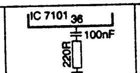
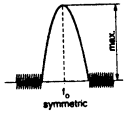
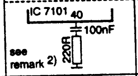
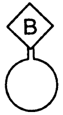
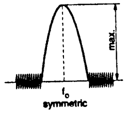

ECO 5 TUNER BOARD / copper side view

5
4
3
2
1
A
B
C
E
D
A
2
3
1
F
C
5
4
C
C
A
B E
41..
Chip jumper
(not all items shown in schematic diagram)

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

marked components to be assembled as service solution for *Local/DX* - switching

TUNER ADJUSTMENT TABLE (ECO5 FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	◇ 1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 50mV continuous wave	◇ F		5119	◇ 2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	◇ A mod=1kHz Δf=±22.5kHz	108MHz	2155	◇ 4	MAX
	87.5MHz (65.81MHz)		87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	◇ A	98MHz	3142	◇ 3	152kHz ±1kHz [1]
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	◇ C Δf=±15kHz V_{RF} = 3mV		5111	◇ 4	
				5112		
AM AFC **MW**		◇ C continuous wave V_{RF} = 10mV		5114	◇ 2	0 ± 2 mV DC
AM RF [3]						
MW [4] FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	 Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	◇ 4	
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		1500kHz	2106		
	560kHz		560kHz	5102		

ECO5, descr. coll. 080797

Use service test program. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

[1] If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

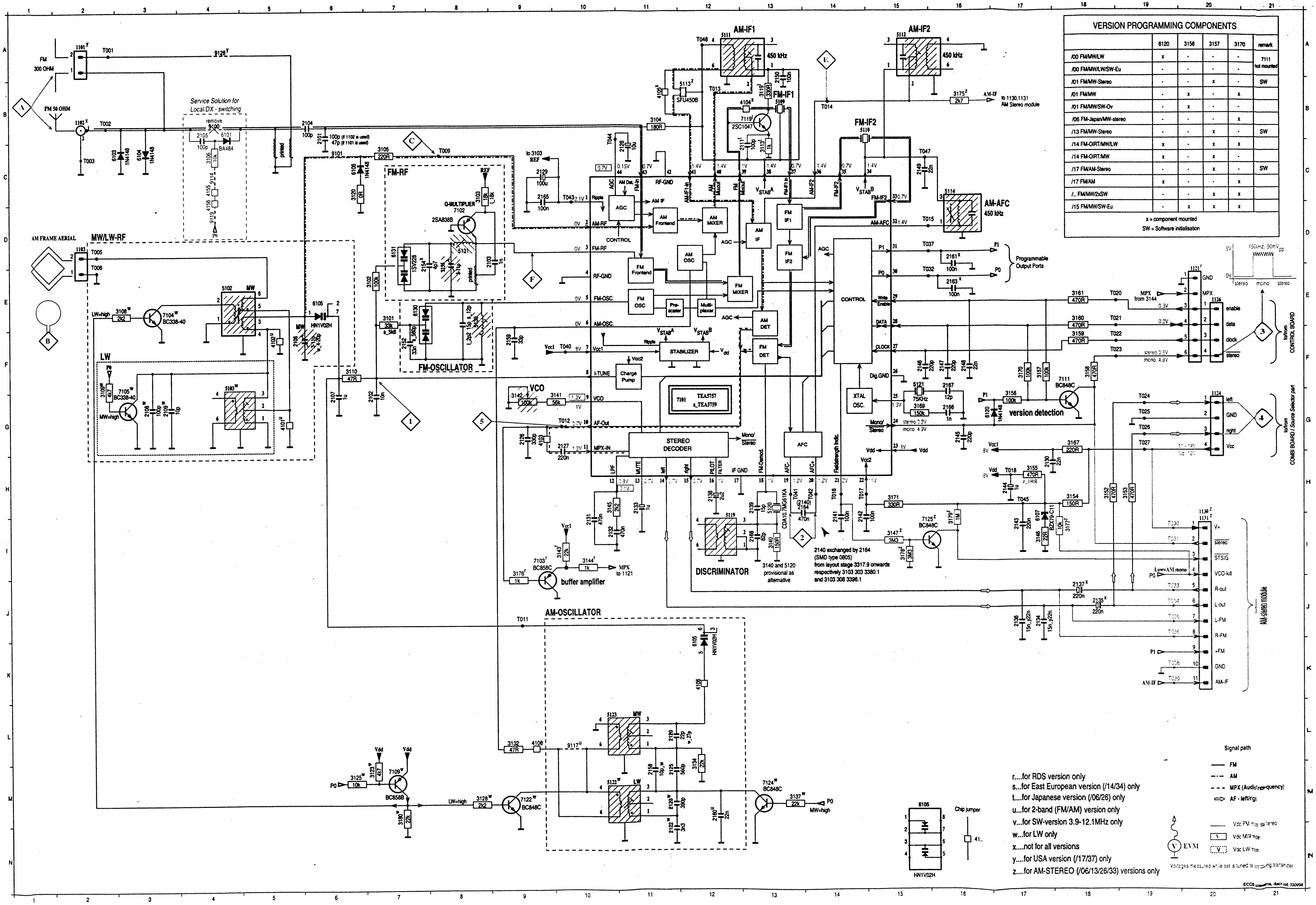
[2] RC network serves for damping the IF-filter while adjusting the other one.

[3] For AM RF adjustments the original frame antenna has to be used !

[4] MW has to be aligned before LW.

↕ Repeat

TUNER BOARD ECO5 / Systems



FM 300 OHM
FM 50 OHM
AM FRAME AERIAL
Service Solution for Local/DX - switching
remove 9100
MW/LW-RF
LW
MW
LW=high
MW=high
FM-RF
Q-MULTIPLIER 7102
2SA838B
FM-OSCILLATOR
VCO
AM-IF1
AM-IF2
FM-IF1
FM-IF2
AM-AFC 450 kHz
450 kHz
SFU450B
2SC1047
7101 TEA5757 z_TEA5759
AGC
AM Frontend
AM MIXER
AM IF
AM OSC
FM Frontend
FM OSC
Pre-scaler
Multi-plexer
FM MIXER
FM IF1
FM IF2
AM DET
FM DET
STABILIZER
Charge Pump
STEREO DECODER
CONTROL
XTAL OSC.
AFC
DISCRIMINATOR
CDA10.7MG61KA
AM-OSCILLATOR
buffer amplifier
version detection
Programmable Output Ports
to/from CONTROL BOARD
to/from COMBI BOARD / Source Selector part
AM-Stereo module
to 1130,1131 AM Stereo module
MPX to 1121
MPX from 3144
enable
data
clock
stereo
left
GND
right
Vcc
V+
STSIG
VCO-kill
R-out
L-out
L-FM
R-FM
+FM
AM-IF
Low=AM mono
150kHz, 50mVpp
stereo mono stereo
2140 exchanged by 2164 (SMD type 0805) from layout stage 3317.9 onwards respectively 3103 303 3380.1 and 3103 308 3396.1
3140 and 5120 provisional as alternative
HN1V02H
Chip jumper
BC338-40
BC858B
BC848C
BC858C
BZX79-C11
1N4148
1SV228
BA484

	6120	3156	3157	3170	remark
/00 FM/MW/LW	x	-	-	-	7111 not mounted
/00 FM/MW/LW/SW-Eu	-	-	-	-	
/01 FM/MW-Stereo	-	-	x	-	SW
/01 FM/MW	-	x	-	x	
/01 FM/MW/SW-Ov	-	x	-	-	
/06 FM-Japan/MW-stereo	-	-	-	x	
/13 FM/MW-Stereo	-	-	x	-	SW
/14 FM-OIRT/MW/LW	x	-	x	x	
/14 FM-OIRT/MW	x	-	x	-	
/17 FM/AM-Stereo	-	-	x	-	SW
/17 FM/AM	x	-	-	x	
/.. FM/MW/2xSW	-	-	x	x	
/15 FM/MW/SW-Eu	-	x	x	x	

VERSION PROGRAMMING COMPONENTS

x = component mounted

SW = Software initialisation

r....for RDS version only
s...for East European version (/14/34) only
t....for Japanese version (/06/26) only
u...for 2-band (FM/AM) version only
v...for SW-version 3.9-12.1MHz only
w...for LW only
x....not for all versions
y....for USA version (/17/37) only
z....for AM-STEREO (/06/13/26/33) versions only

Signal path

- FM
- AM
- MPX (Audiofrequency)
- AF - left/right

EVM

Vdc FM mode stereo

Vdc MW mode

Vdc LW mode

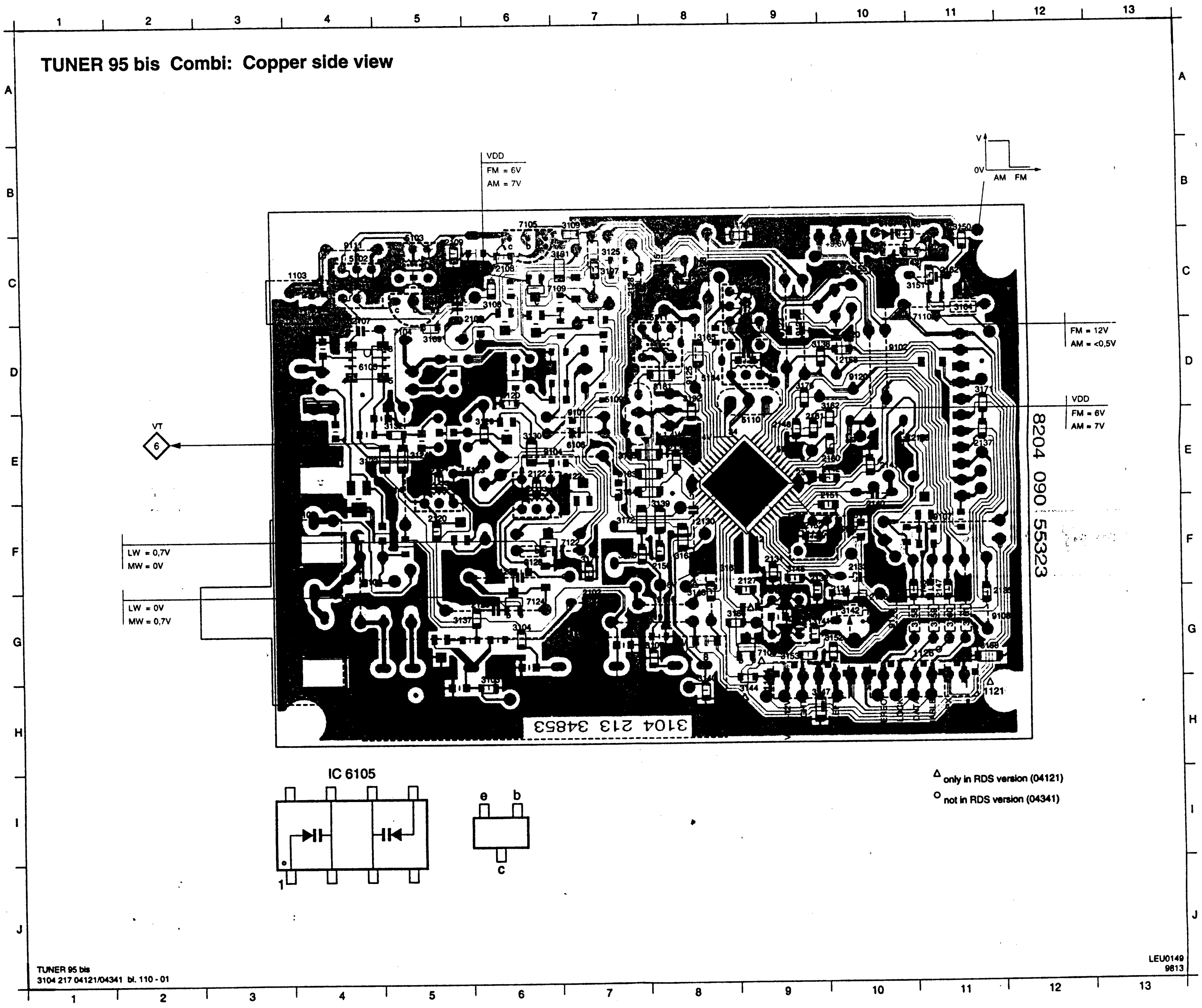
Voltages measured while set is tuned to strong transmitter

ECO5 systems, discr.coil, 030998

1101 A 1
1102 B 2
1103 D 2
1121 E20
1124 G20
1126 E20
1130 I20
1131 I20
2101 C 6
2102 G 7
2103 D 9
2104 B 6
2106 F 5
2107 G 6
2108 G 3
2109 G 3
2111 C13
2120 L11
2122 N11
2123 M11
2125 M11
2126 G 9
2127 G10
2128 C11
2129 C 9
2130 H17
2131 I10
2132 I10
2133 H11
2134 J17
2135 J18
2136 J17
2137 J18
2138 H12
2139 H13
2140 H14
2141 H14
2142 H14
2143 I17
2144 H17
2145 G16
2146 F15
2147 F16
2148 F16
2149 C15
2150 B13
2152 F 7
2153 E 8
2154 E 7
2155 D 8
2158 M11
2159 F 9
2160 M12
2161 D16
2163 E16
2164 H14
2165 C 9
2166 G16
2167 F16
2168 I 13
3101 E 7
3102 E 7
3103 C 8
3104 B11
3105 C 7
3108 E 3
3109 F 2
3110 F 6
3113 C13
3119 B13
3120 C 6
3123 M 7
3125 M 6
3128 M 8
3132 L 9
3134 M12
3137 M13
3140 I13
3141 G10
3142 G 9
3143 I10
3144 I10
3145 H10
3146 I17
3147 I15
3152 H18
3153 H19
3154 H18
3155 H17
3156 G17
3157 F17
3158 F18
3159 F18
3160 E18
3161 E18
3167 G18
3169 G15
3170 F17
3171 H15
3175 B16
3176 J 9
3177 I18
3178 I15
3179 I16
3180 M7
4101 G 5
4102 F 5
4103 G 9
4104 B13
4105 B11
4106 K12
4108 L 9
5102 E 4
5103 F 4
5109 B13
5110 B14
5111 A13
5112 A15
5113 B12
5114 C16
5119 I 12
5120 H13
5121 F15
5122 M11
5123 L11
5130 E 8
5131 D 8
6103 C 2
6104 C 3
6105 K12
6105 E 6
6106 C 6
6107 H17
6120 G16
6130 E 7
6131 D 7
7101 G11
7102 D 8
7103 I 9
7104 E 3
7105 F 2
7109 M 7
7111 F16
7119 B13
7122 M 9
7124 M13
7125 I16
9100 B 4
9101 C 6
9117 L10
9128 A 4

1102	F4
1103	C4
1110	G7
1121	H11
1124	H9
1126	G10
2102	G7
2106	C5
2107	C4
2108	C6
2109	C5
2120	F5
2122	E6
2123	F6
2125	G6
2127	F9
2128	C7
2129	C8
2130	F8
2131	F9
2132	F9
2133	F10
2134	G10
2135	G11
2136	G10
2137	E11
2138	E10
2139	E8
2140	F10
2141	E10
2142	E9
2143	C10
2144	E10
2145	G11
2147	G11
2148	E9
2150	F8
2151	F9
2152	F9
2158	D10
2160	E9
2161	E9
2162	C11
3103	H6
3104	G6
3107	G7
3108	C6
3109	B7
3120	D6
3123	E4
3124	E5
3125	C7
3128	F6
3129	E6
3130	E6
3131	C6
3132	E5
3134	E5
3137	G5
3138	D9
3139	F8
3140	H8
3141	G9
3142	G10
3143	G8
3144	H9
3145	F9
3146	B10
3147	H9
3150	C11
3151	C10
3152	G9
3153	G9
3154	C10
3155	C10
3158	G11
3159	G11
3160	G11
3161	G11
3162	D9
3163	F8
3164	C11
3165	D6
3167	F8
3169	D5
3171	D11
3172	F7
3173	F7
3176	D9
3177	F7
3178	B8
3181	D8
3183	E7
3184	E7
3185	E7
3186	G8
3188	G11
3192	D8
3197	C7
5102	C4
5103	C5
5107	F10
5109	D7
5110	E9
5111	C8
5112	C9
5114	D8
5115	G9
5121	E9
5122	E7
5123	E5
6105	D4
6106	E7
6107	B10
6120	D10
7101	E9
7103	G9
7104	D5
7105	B6
7109	C6
7110	D11
7122	F7
7124	G6
9100	F4
9101	E7
9102	D10
9104	E6
9107	F11
9106	G11
9111	C4
9114	E5
9115	C8
9116	G8
9118	G10
9119	G7
9120	D10
9121	D9
9123	D9
9125	D6
9126	C8

TUNER 95 bis Combi: Copper side view



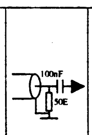
△ only in RDS version (04121)

○ not in RDS version (04341)

TUNER 95 bis
3104 217 04121/04341 bl. 110 - 01

LEU0149
9813

TUNER 95 bis Adjustment Table (FM, MW, LW with Frame antenna)

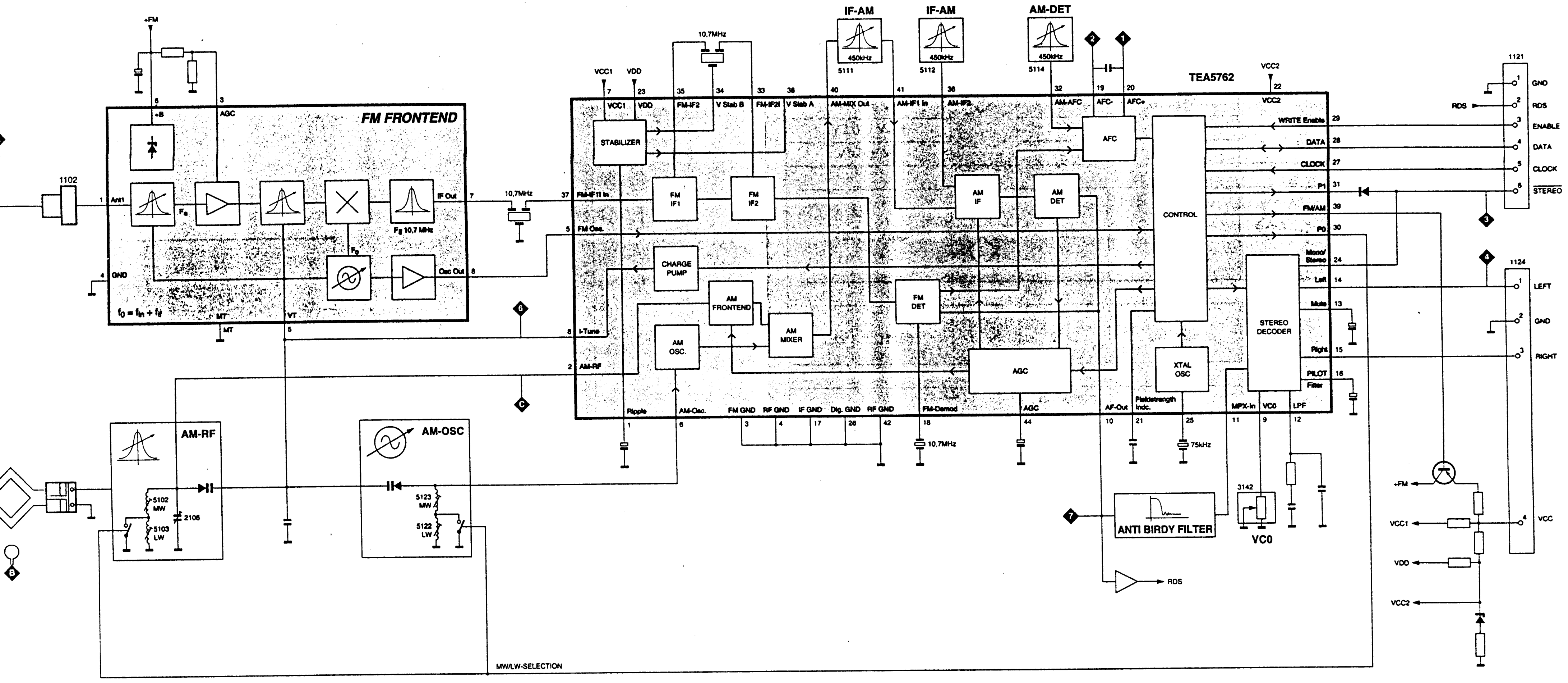
Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM (50)			108 MHz	check	◇6	7 ... 9V
87.5 - 108 MHz			87.5 MHz	check		1.3 ... 2V
MW (9)			1602 kHz	5123		8.3V ± 0.2V
531 - 1602 kHz			531 kHz	check		1V ± 0.4V
LW (3)			279 kHz	5122		8.3V ± 0.2V
153 - 279 kHz			153 kHz	check		1V ± 0.4V
FM – DETECTION						
FM	98 MHz 1mV continuous wave ***short pin 21 (IC7101) to ground***	◇A	98 MHz	5107	◇1 ◇2	0mV ± 3mV
FM – VCO						
FM	98 MHz 1 mV continuous wave	◇A	98 MHz	3142	◇3	152kHz ± 1 kHz
DISTORTION						
FM	98 MHz 1 mV 90 % L + 9 % pilot mod = 1kHz	◇A	98MHz	mixcoil inside Tuner 1110	◇4	Distortion minimum
AM – IF						
MW	450kHz Δf = 10kHz Low as possible Swept signal	 100nF 50E ◇C	MW	5111	◇7	symmetrical and max. height ↕
				5112		
	450kHz continuous wave			5114	◇1 ◇2	0mV ± 2mV
AM - RF						
MW	558kHz Mod = 1kHz 30 % AM 1494 kHz	◇B	558kHz	5102	◇7	MAX ↕
			1494kHz	2106		
LW	198kHz mod = 1kHz 30 % AM	*	198kHz	5103		MAX

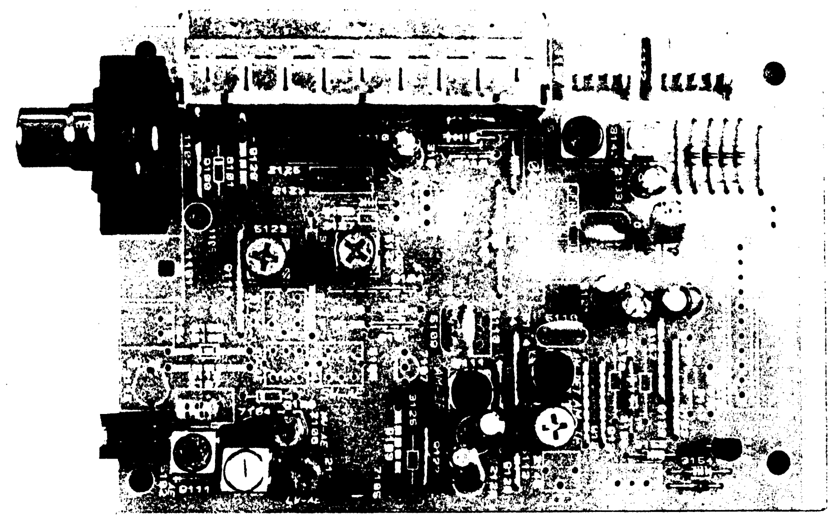
adjtable for 3104 217 04121/04341

* Signal send via a frame antenna
(..) = tuning grid in kHz

↕ repeat

OCKDIAGRAM


+FM
6
+B
3
AGC
FM FRONTEND
1102
1 Ant1
Fe
IF Out 7
Fif 10,7 MHz
Fo
Osc Out 8
4 GND
f0 = fin + fif
MT
VT
5
10,7MHz
AM-RF
5102 MW
5103 LW
2106
AM-OSC
5123 MW
5122 LW
MW/LW-SELECTION
IF-AM
450kHz
5111
IF-AM
450kHz
5112
AM-DET
450kHz
5114
TEA5762
VCC1
VDD
10,7MHz
VCC2
7 VCC1
23 VDD
35 FM-IF2
34 V Stab B
33 FM-IF2I
38 V Stab A
40 AM-MIX Out
41 AM-IF1 In
36 AM-IF2
32 AM-AFC
19 AFC-
20 AFC+
22 VCC2
STABILIZER
FM IF1
FM IF2
AM IF
AM DET
AFC
CONTROL
37 FM-IF11 In
5 FM Osc.
CHARGE PUMP
AM FRONTEND
AM MIXER
AM OSC.
FM DET
AGC
XTAL OSC
STEREO DECODER
8 I-Tune
2 AM-RF
WRITE Enable 29
DATA 28
CLOCK 27
P1 31
FM/AM 39
P0 30
Mono/Stereo 24
Left 14
Mute 13
Right 15
PILOT Filter 16
Ripple 1
AM-Osc. 6
FM GND 3
RF GND 4
IF GND 17
Dig. GND 26
RF GND 42
FM-Demod 18
10,7MHz
AGC 44
AF-Out 10
Fieldstrength Indc. 21
25
75kHz
MPX-In 11
VC0 9
LPF 12
ANTI BIRDY FILTER
3142
VC0
RDS
1121
1 GND
2 RDS
3 ENABLE
4 DATA
5 CLOCK
6 STEREO
RDS
1124
1 LEFT
2 GND
3 RIGHT
4 VCC
+FM
VCC1
VDD
VCC2
1
2
3
4
6
7
B
C



TUNER 95 BOARD

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Circuit diagram..........7D-3
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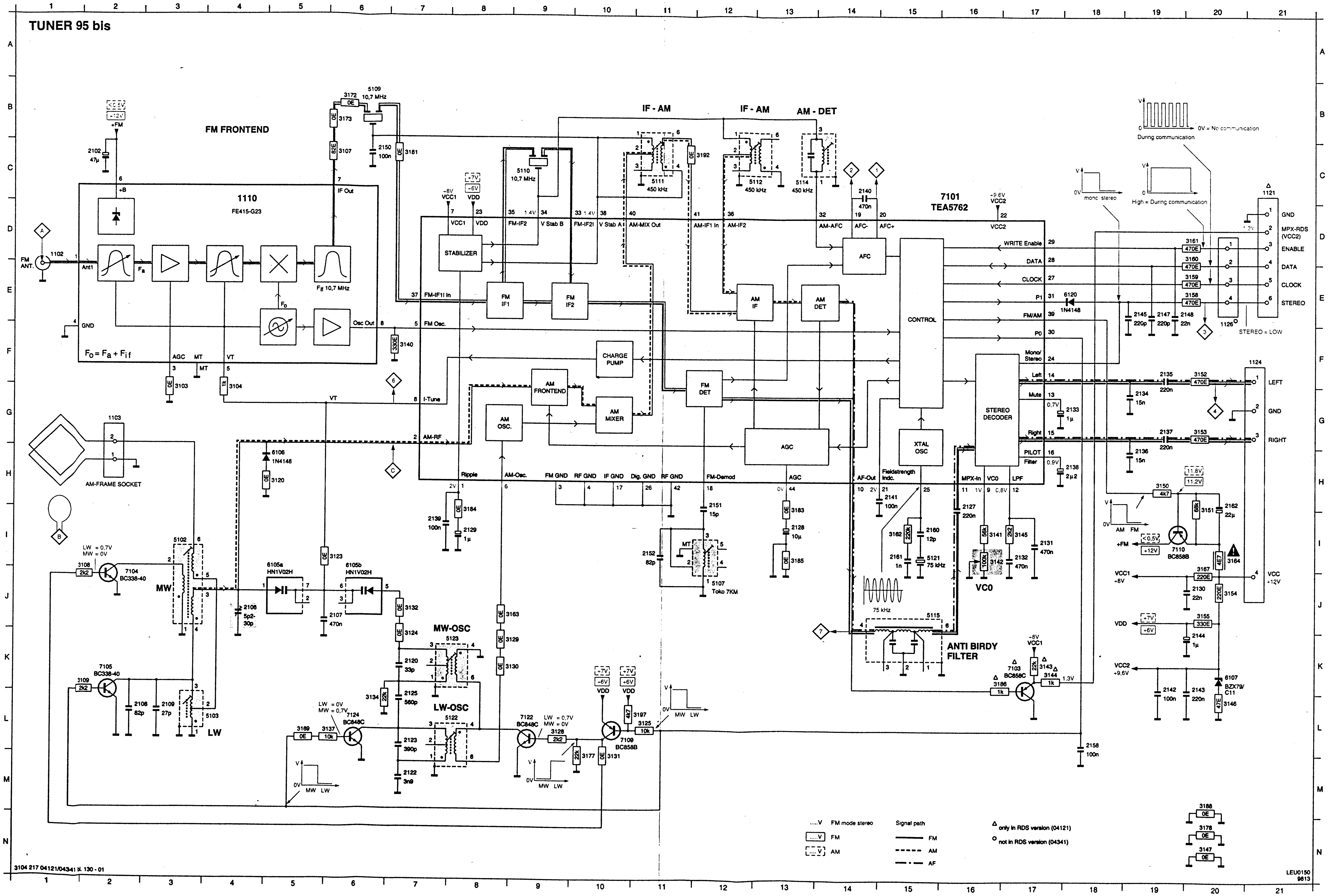
1102	D1
1103	G2
1110	D4
1121	C21
1124	F21
1126	E20
2102	C2
2106	J4
2107	J6
2108	L2
2109	L3
2120	K7
2122	M7
2123	L7
2125	L7
2127	H16
2128	I13
2129	I8
2130	J20
2131	I17
2132	I17
2133	G18
2134	G19
2135	F19
2136	H19
2137	G19
2138	H18
2139	I7
2140	C14
2141	H15
2142	K19
2143	K20
2144	K20
2145	E19
2147	E19
2148	E19
2150	C6
2151	H12
2152	I11
2158	L18
2160	I15
2161	I15
2162	H20
3103	G3
3104	G4
3107	C6
3108	J1
3109	K1
3120	H5
3123	I6
3124	K7
3125	L11
3128	L9
3129	K8
3130	K8
3131	M10
3132	J7
3134	L6
3137	L5
3140	F7
3141	I16
3142	I16
3143	K17
3144	K17
3145	I17
3146	L20
3147	N20
3150	H19
3151	I20
3152	F20
3153	G20
3154	J20
3155	J20
3158	E19
3159	E19
3160	D19
3161	D19
3162	I15
3163	J8
3164	I20
3167	I20
3169	L5
3172	B6
3173	B6
3177	M10
3178	N20
3181	C7
3183	I13
3184	I8
3185	I13
3186	K16
3188	M20
3192	C12
3197	L11
5102	I3
5103	L4
5107	J12
5109	B6
5110	C9
5111	C11
5112	C12
5114	C13
5115	J15
5121	I15
5122	L7
5123	K7
6105a	I5
6105b	I6
6106	H5
6107	K20
6120	E17
7101	C15
7103	K17
7104	J2
7105	K2
7109	L10
7110	I19
7122	L9
7124	L6

TUNER 95 bis


FM FRONTEND
1110
FE415-G23
FM ANT.
1102
Ant1
Fa
Fif 10,7 MHz
Fo
IF Out
Osc Out
GND
+B
AGC
MT
VT
Fo = Fa + Fif
2102 47µ
3103 0E
3104 1k
3172 0E
5109 10,7 MHz
3173 0E
3107 82E
2150 100n
3181 0E
3140 330E
<0,5V
+12V
+FM
IF - AM
IF - AM
AM - DET
5110 10,7 MHz
5111 450 kHz
5112 450 kHz
5114 450 kHz
3192 0E
2140 470n
7101
TEA5762
VCC1
VDD
VCC2
STABILIZER
FM IF1
FM IF2
AM IF
AM DET
AFC
CONTROL
CHARGE PUMP
AM FRONTEND
AM MIXER
AM OSC.
FM DET
AGC
XTAL OSC
STEREO DECODER
FM-IF2
V Stab B
FM-IF2I
V Stab A
AM-MIX Out
AM-IF1 In
AM-IF2
AM-AFC
AFC-
AFC+
FM-IF1I In
FM Osc.
I-Tune
AM-RF
Ripple
AM-Osc.
FM GND
RF GND
IF GND
Dig. GND
FM-Demod
AF-Out
Fieldstrength Indc.
MPX-In
VCO
LPF
WRITE Enable
DATA
CLOCK
P1
FM/AM
P0
Mono/Stereo
Left
Mute
Right
PILOT
Filter
2139 100n
3184 0E
2129 1µ
2151 15p
2152 82p
5107 Toko 7KM
3183 0E
2128 10µ
3185 0E
2141 100n
3162 220k
2160 12p
2161 1n
5121 75 kHz
2127 220n
3141 56k
3145 2k2
3142 100k
2132 470n
2131 470n
VCO
75 kHz
5115
ANTI BIRDY FILTER
AM-FRAME SOCKET
1103
MW
LW
5102
5103
3108 2k2
7104 BC338-40
LW = 0,7V
MW = 0V
3109 2k2
7105 BC338-40
2108 82p
2109 27p
6106 1N4148
3120 0E
6105a HN1V02H
6105b HN1V02H
2106 5p2-30p
3123 0E
2107 470n
3132 0E
3124 0E
MW-OSC
5123
2120 33p
3134 22k
2125 560p
LW-OSC
5122
2123 390p
2122 3n9
3163 0E
3129 0E
3130 0E
3169 0E
3137 10k
7124 BC848C
LW = 0V
MW = 0,7V
7122 BC848C
LW = 0,7V
MW = 0V
3128 2k2
3177 22k
3131 0E
7109 BC858B
3197 4k7
3125 10k
MW LW
AM FM
+7V
+6V
VDD
2158 100n
3161 470E
3160 470E
3159 470E
3158 470E
6120 1N4148
2145 220p
2147 220p
2148 22n
1126
STEREO = LOW
1121
GND
MPX-RDS (VCC2)
ENABLE
DATA
CLOCK
STEREO
0V = No communication
During communication
mono stereo
High = During communication
2135 220n
3152 470E
2134 15n
2133 1µ
2137 220n
3153 470E
2136 15n
2138 2µ2
1124
LEFT
GND
RIGHT
VCC +12V
3150 4k7
3151 68k
2162 22µ
7110 BC858B
11,8V
11,2V
3164 4E7
3167 220E
2130 22n
3154 220E
3155 330E
2144 1µ
VCC1 +8V
VCC2 +9,6V
2142 100n
2143 220n
6107 BZX79/C11
3146 47E
7103 BC858C
3186 1k
3143 22k
3144 1k
1,3V
3188 0E
3178 0E
3147 0E
....V FM mode stereo
V FM
V AM
Signal path
FM
AM
AF
△ only in RDS version (04121)
○ not in RDS version (04341)

3104 217 04121/04341 bl. 130 - 01

LEU0150
9613

ELECTRICAL PARTS LIST - ECO5 TUNER BOARD

MISCELLANEOUS

1101	4822 267 31505	Antenna Socket 300R	
1102	4822 267 10283	Antenna Socket Coax IEC 75R	

CAPACITORS

2101	5322 122 32531	100pF 5% 50V	
2101	4822 126 13692	47pF 1% 63V	for USA
2102	4822 122 33177	10nF 20% 50V	
2103	5322 122 34123	1nF 10% 50V	
2104	4822 122 33195	100pF 10% 50V	
2106	4822 125 50355	Trimmer 4-20pF	for LW version
2106	4822 125 60101	Trimmer 3-11pF 100V	
2107	4822 121 51319	1µF 10% 63V	
2108	5322 122 32531	100pF 5% 50V	for LW version
2109	5322 122 32448	10pF 5% 50V	for LW version
2120	4822 126 13691	27pF 1% 63V	for LW version
2120	5322 122 32658	22pF 5% 50V	
2122	4822 122 33891	3,3nF 10% 63V	for LW version
2125	4822 121 51381	560pF 5% 400V	
2126	5322 122 31863	330pF 5% 50V	
2127	4822 126 13473	220nF +80/-20% 50V	
2128	4822 124 41579	10µF 20% 50V	
2129	4822 124 41584	100µF 20% 10V	
2130	4822 126 11585	22nF+80/- 20% 25V	
2131	4822 122 33325	470nF 16V	
2132	4822 122 33325	470nF 16V	
2131	4822 126 13482	470nF +80/- 20% 16V	
2132	4822 126 13482	470nF +80/- 20% 16V	
2133	4822 124 40242	1µF 20% 63V	
2134	4822 126 13188	15nF 5% 63V	
2134	5322 122 32654	22nF 10% 63V	for USA
2135	4822 124 40746	0,22µF 20% 63V	
2136	4822 126 13188	15nF 5% 63V	
2136	5322 122 32654	22nF 10% 63V	for USA
2137	4822 124 40746	0,22µF 20% 63V	
2138	4822 124 41576	2,2µF 20% 50V	
2139	4822 126 14236	50V 15pF 5%	
2140	4822 121 51252	470nF 5% 63V	
2141	4822 126 10002	100nF 20% 25V	
2142	4822 126 10002	100nF 20% 25V	
2143	4822 126 13473	220nF +80/-20% 50V	
2144	4822 124 40242	1µF 20% 63V	
2145	4822 122 33575	220pF 5% 50V	
2146	4822 122 33575	220pF 5% 50V	
2147	4822 122 33575	220pF 5% 50V	
2148	4822 126 11585	22nF+80/- 20% 25V	
2149	5322 122 32654	22nF 10% 63V	
2150	4822 122 31947	100nF 20% 63V	
2152	5322 116 80853	560pF 5% 63V	for East. Europe
2152	4822 126 12105	33nF 5% 63V	
2153	4822 122 32139	12pF 2% 63V	for East Europe
2153	4822 122 32504	15pF 2% 63V	
2155	4822 125 60101	Trimmer 3-11pF 100V	
2158	5322 122 32448	10pF 5% 50V	for LW version
2159	5322 122 32659	33pF 5% 50V	
2160	5322 122 32654	22nF 10% 63V	
2161	4822 126 10002	100nF 20% 25V	
2163	4822 126 10002	100nF 20% 25V	
2164	4822 126 13482	470nF +80/- 20% 16V	
2165	4822 126 10002	100nF 20% 25V	
2166	5322 122 34123	1nF 10% 50V	
2167	4822 122 32139	12pF 2% 63V	
2168	4822 126 13695	82pF 1% 63V	

RESISTORS

3101	4822 051 20562	5k6 5% 0,1W	for East. Europe
3101	4822 051 20333	33k 5% 0,1W	
3102	4822 051 20104	100k 5% 0,1W	
3103	4822 117 10965	18k 1% 0,1W	
3104	4822 117 11448	180R 1% 0,1W	
3105	4822 116 83872	220R 5% 0,5W	
3108	4822 117 11449	2k2 1% 0,1W	for LW version
3109	4822 051 20472	4k7 5% 0,1W	for LW version
3110	4822 116 52195	47R 5% 0,5W	
3120	4822 051 20008	0R Jumper 0805	
3123	4822 051 20472	4k7 5% 0,1W	for LW version
3125	4822 117 10833	10k 1% 0,1W	for LW version
3128	4822 117 11449	2k2 1% 0,1W	for LW version
3132	4822 116 52195	47R 5% 0,5W	
3134	4822 051 20223	22k 5% 0,1W	
3137	4822 051 20223	22k 5% 0,1W	for LW version
3140	4822 051 20008	0R Jumper 0805	
		5120=CDA10.7MG40K	
3140	4822 117 10353	150R 1% 0,1W	
		5120=CDA10.7MG61KA	
3141	4822 051 20563	56k 5% 0,1W	
3142	4822 100 11163	Trimmer 100k 30% 0,1W	
3143	4822 051 20223	22k 5% 0,1W	for RDS version
3144	4822 051 10102	1k 2% 0,25W	for RDS version
3145	4822 117 11449	2k2 1% 0,1W	
3146	4822 051 20229	22R 5% 0,1W	
3152	4822 116 83883	470R 5% 0,5W	
3153	4822 051 20471	470R 5% 0,1W	
3154	4822 116 83868	150R 5% 0,5W	
3155	4822 051 20471	470R 5% 0,1W	
3156	4822 051 20104	100k 5% 0,1W	for /21/30/33 only
3157	4822 116 52234	100k 5% 0,5W	for East. Europe
3158	4822 116 83883	470R 5% 0,5W	
3159	4822 116 83883	470R 5% 0.5W	
3160	4822 116 83883	470R 5% 0,5W	
3161	4822 116 83883	470R 5% 0,5W	
3167	4822 117 11503	220R 1% 0.1W	
3169	4822 051 20154	150k 5% 0,1W	
3170	4822 116 52234	100k 5% 0,5W	
3171	4822 116 52219	330R 5% 0,5W	

ELECTRICAL PARTS LIST - ECO5 TUNER BOARD

3176	4822 051 10102	1k 2% 0,25W	for RDS version
3180	4822 051 20223	22k 5% 0,1W	for LW version
4101	4822 051 20008	0R Jumper 0805	for 2-Band only
4102	4822 051 20008	0R Jumper 0805	for 2-Band only
4103	4822 051 20008	0R Jumper 0805	
4104	4822 051 20008	0R Jumper 0805	
4105	4822 051 20008	0R Jumper 0805	
4106	4822 051 20008	0R Jumper 0805	
4108	4822 051 20008	0R Jumper 0805	
4111	4822 051 20008	0R Jumper 0805	
4120	4822 051 20008	0R Jumper 0805	
4150	4822 051 10008	0R Jumper 1206	
4151	4822 051 20008	0R Jumper 0805	
4152	4822 051 10008	0R Jumper 1206	
4153	4822 051 10008	0R Jumper 1206	
4154	4822 051 10008	0R Jumper 1206	
4155	4822 051 10008	0R Jumper 1206	
4156	4822 051 20008	0R Jumper 0805	
4157	4822 051 10008	0R Jumper 1206	
4158	4822 051 10008	0R Jumper 1206	
4159	4822 051 10008	0R Jumper 1206	
4162	4822 051 10008	0R Jumper 1206	

COILS & FILTERS

5102	4822 157 71634	MW RF Coil	
5103	4822 157 71635	LW RF Coil	for LW version
5109	4822 242 70665	Ceram Filter 10,7MHz	
5110	4822 242 70665	Ceram Filter 10,7MHz	
5111	4822 158 60511	AM-IF Filter 450kHz	
5112	4822 157 70302	AM-IF Filter 450kHz	
5114	4822 157 70302	AM-IF Filter 450kHz	
5119	4822 157 11443	Discriminator 10,7MHz	
5120	4822 242 82065	Cer. Disc. 10,7MG40K	
5120	4822 242 10251	Cer. Disc.10,7MG61KA-TF21	
5121	4822 242 10261	Quartz 75kHz	
5122	4822 157 60517	Osc. Coil LW	for LW version
5123	4822 157 60517	Osc. Coil MW	
5130	4822 156 30947	RF-Coil 1.5T	
5131	4822 156 30947	RF-Coil 1.5T	

DIODES

6103	4822 130 30621	1N4148	
6104	4822 130 30621	1N4148	
6105	4822 130 83075	HN1V02H-B	
6106	4822 130 30621	1N4148	
6107	4822 130 34488	BZX79-B11	
6120	4822 130 30621	1N4148	not for /21/30/33
6130	4822 130 82833	1SV228	
6131	4822 130 82833	1SV228	

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90924	TEA5757H/V1	
7102	4822 130 60093	2SA838B	
7103	4822 130 42513	BC858C	for RDS version
7104	5322 130 44779	BC338-40	for LW version
7105	5322 130 44779	BC338-40	for LW version
7109	5322 130 41983	BC858B	for LW version
7111	5322 130 42136	BC848C	
7122	5322 130 42136	BC848C	for LW version
7124	5322 130 42136	BC848C	for LW version

Note: Only the parts mentioned in this list are normal service spare parts.

MISCELLANEOUS

1102	4822 267 10283	Socket Coaxial IEC 75R
1103	4822 265 31184	JST Connector 2 pin
1110	4822 210 10739	Frontend Assembly FE415-G23

CAPACITORS

2102	4822 124 40433	47µF 20% 25V
2106	4822 125 60102	Trimmer 5,2-30pF 100V
2107	4822 121 51252	470nF 5% 63V
2108	4822 126 13695	82pF 1% 63V
2109	4822 126 13691	27pF 1% 63V
2120	5322 122 32659	33pF 5% 50V
2122	5322 126 10465	3,9nF 10% 50V
2123	4822 121 10766	390pF 1% 630V
2125	4822 121 10578	560pF 1% 630V
2127	4822 122 32927	220nF +80/-20% 50V
2128	4822 124 41579	10µF 20% 50V
2129	4822 124 40242	1µF 20% 63V
2130	4822 126 11585	22nF +80/-20% 25V
2131	4822 122 33325	470nF 16V
2132	4822 122 33325	470nF 16V
2133	4822 124 40242	1µF 20% 63V
2134	4822 126 13188	15nF 5% 63V
2135	4822 122 32927	220nF +80/-20% 50V
2136	4822 126 13188	15nF 5% 63V
2137	4822 122 32927	220nF +80/-20% 50V
2138	4822 124 41576	2,2µF 20% 50V
2139	4822 126 10002	100nF 20% 25V
2140	4822 121 51252	470nF 5% 63V
2141	4822 122 31947	100nF 20% 63V
2142	4822 122 31947	100nF 20% 63V
2143	4822 122 32927	220nF +80/-20% 50V
2144	4822 124 40242	1µF 20% 63V
2145	4822 122 33575	220pF 5% 50V
2147	4822 122 33575	220pF 5% 50V
2148	4822 122 33809	22nF 20% 50V
2150	4822 122 31947	100nF 20% 63V
2151	4822 126 14236	15pF 5% 50V
2152	4822 126 13695	82pF 1% 63V
2158	4822 122 31947	100nF 20% 63V
2160	4822 122 32139	12pF 2% 63V
2161	5322 122 34123	1nF 10% 50V
2162	4822 124 81151	22µF 50V

RESISTORS

3103	4822 051 20008	0R Jumper 0805
3104	4822 051 10102	1k 2% 0,25W
3107	4822 051 20829	82R 5% 0,1W
3108	4822 117 11449	2k2 1% 0,1W
3109	*4822 117 11449*	*2k2 1% 0,1W*
3120	4822 051 20008	0R Jumper 0805
3123	4822 051 10008	0R Jumper 1206
3124	4822 051 10008	0R Jumper 1206
3125	4822 116 83864	10k 5% 0,5W
3128	4822 116 52256	2k2 5% 0,5W
3129	4822 051 20008	0R Jumper 0805
3130	4822 051 10008	0R Jumper 1206
3131	4822 051 10008	0R Jumper 1206
3132	4822 051 20008	0R Jumper 0805
3134	4822 051 20223	22k 5% 0,1W
3137	4822 117 10833	10k 1% 0,1W
3138	4822 051 20008	0R Jumper 0805
3139	4822 051 10008	0R Jumper 1206
3140	4822 051 20331	330R 5% 0,1W
3141	4822 117 11148	56k 1% 0,1W
3142	4822 100 11163	Trimmer 100k 30% 0,1W
3143	4822 051 20223	22k 5% 0,1W
3144	4822 051 10102	1k 2% 0,25W
3145	4822 117 11449	2k2 1% 0,1W
3146	4822 051 20479	47R 5% 0,1W
3147	4822 051 10008	0R Jumper 1206
3150	4822 051 20472	4k7 5% 0,1W
3151	4822 051 20683	68k 5% 0,1W
3152	4822 051 20471	470R 5% 0,1W
3153	4822 051 20471	470R 5% 0,1W
3154	4822 116 83872	220R 5% 0,5W
3155	4822 116 52219	330R 5% 0,5W
3158	4822 116 83883	470R 5% 0,5W
3159	4822 116 83883	470R 5% 0,5W
3160	4822 116 83883	470R 5% 0,5W
3161	4822 116 83883	470R 5% 0,5W
3162	4822 117 13579	220k 1% 0,1W
3163	4822 051 10008	0R Jumper 1206
3164	4822 052 10478	⚠ 4R7 5% 0,33W
3165	4822 051 10008	0R Jumper 1206
3167	4822 116 83872	220R 5% 0,5W
3169	4822 051 20008	0R Jumper 0805
3171	4822 051 20008	0R Jumper 0805
3172	4822 051 10008	0R Jumper 1206
3173	4822 051 20008	0R Jumper 0805
3176	4822 051 20008	0R Jumper 0805
3177	4822 051 20223	22k 5% 0,1W
3178	4822 051 10008	0R Jumper 1206
3181	4822 051 10008	0R Jumper 1206
3183	4822 051 10008	0R Jumper 1206
3184	4822 051 10008	0R Jumper 1206
3185	4822 051 10008	0R Jumper 1206
3186	4822 051 10102	1k 2% 0,25W
3188	4822 051 10008	0R Jumper 1206
3192	4822 051 20008	0R Jumper 0805
3197	4822 051 20472	4k7 5% 0,1W

COILS & FILTERS

5102	4822 157 71634	MW Aerial
5103	4822 157 71635	LW Aerial

5107	4822 157 11443	FM Discriminator 10,7MHz
5109	4822 157 71639	Ceram Filter 10,7MHz
5110	4822 242 70665	Ceram Filter 10,7MHz
5111	4822 158 60511	AM-IF Filter 450kHz
5112	4822 157 70302	AM-IF Filter 450kHz
5114	4822 157 70302	AM_IF Filter 450kHz
5115	4822 157 71636	Anti-Birdy Filter
5121	4822 242 10261	X'tal Resonator 75kHZ
5122	4822 157 60517	RF Coil AM
5123	4822 157 60517	RF Coil AM

DIODES

6105	4822 130 83075	HN1V02H-B
6106	4822 130 30621	1N4148
6107	4822 130 34488	BZX79-C11
6120	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1
7103	4822 130 42513	BC858C
7104	5322 130 44779	BC338-40
7105	5322 130 44779	BC338-40
7109	5322 130 41983	BC858B
7110	5322 130 41983	BC858B
7122	5322 130 42136	BC848C
7124	5322 130 42136	BC848C

Note : Only the parts mentioned in this list are normal service spare parts.

ETF6-FE TAPE MODULE

(Non-Dolby Version)

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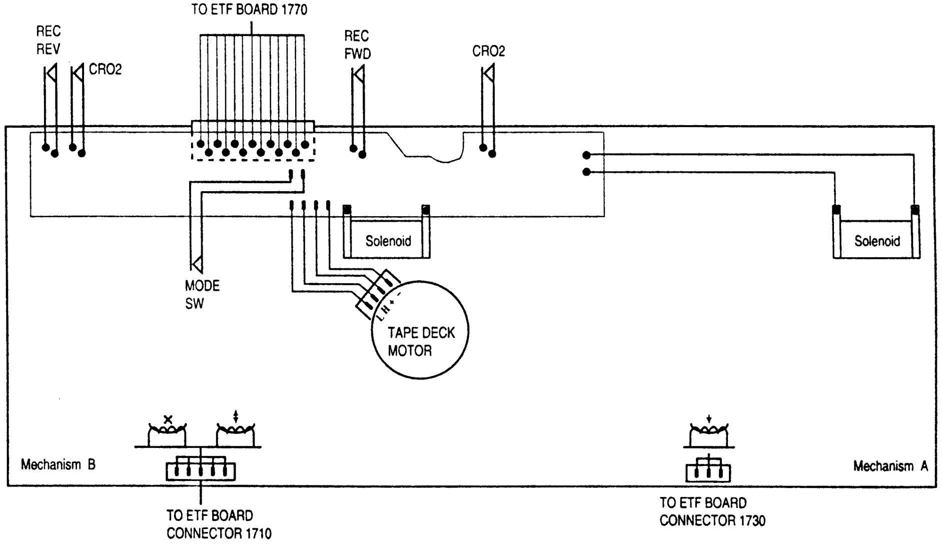
Tapedeck wiring (Double deck)


TO ETF BOARD 1770
REC REV
CRO2
REC FWD
CRO2
Solenoid
Solenoid
MODE SW
TAPE DECK MOTOR
Mechanism B
Mechanism A
TO ETF BOARD CONNECTOR 1710
TO ETF BOARD CONNECTOR 1730

OPTIONS / VARIANTS TABLE

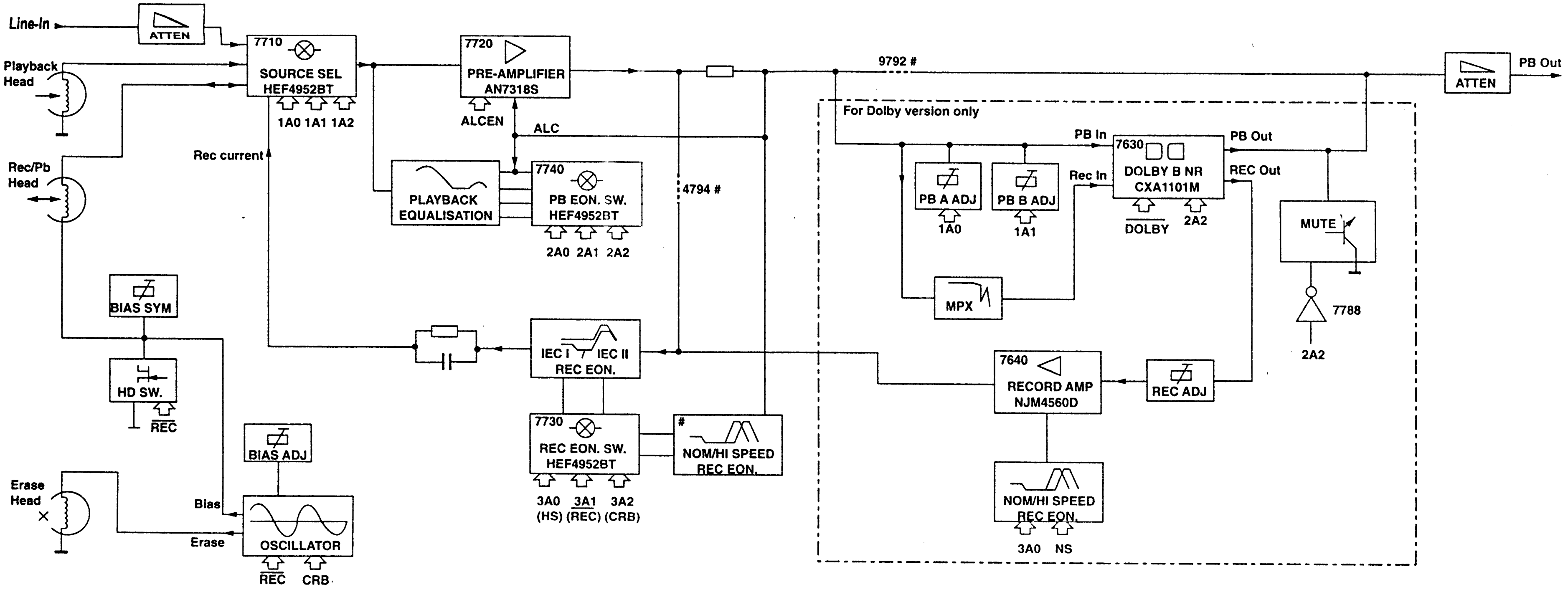
MODULE	**ETF6-FE**	
VARIANT	**1**	**2**
NAME	**ND/DD/FR**	**ND/DD/FF**
Deck configuration	double	double
Autoreverse	yes (B)	no
Auto-replay	no	yes (B)
Motor configuration	single	single
Auto tape type selection	yes	yes
Dolby B type Noise Reduction	no	no
19 kHz pilot suppression	no	no
High speed dubbing	yes	yes

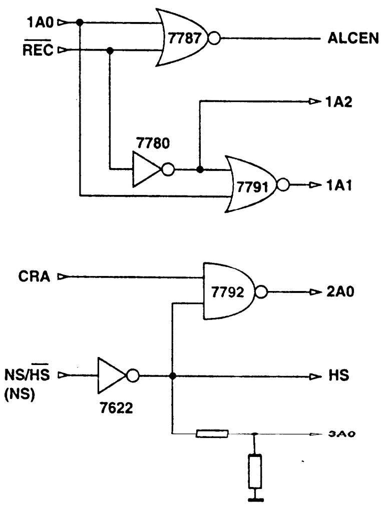
DB	=	Dolby B NR
DD	=	Double Deck
FF	=	Non-Autoreverse
FR	=	Autoreverse Deck B
ND	=	Non-Dolby
SD	=	Single Deck

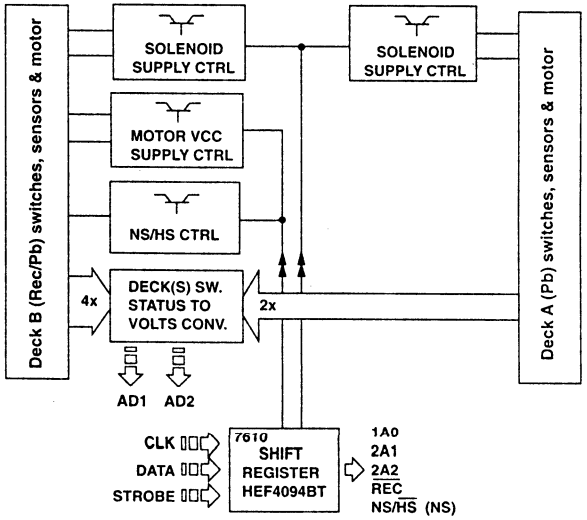
Variations table for Analog Circuit

	Autoreverse	Non-autoreverse
	ND/DD/FR	ND/DD/FF
1760	-	-
1770	use	use
3723	12k	15k
3724	12k	15k
3743	1k2	1k
3744	1k2	1k
3769	12k	8k2
3772	4k7	5k6
3774	10k	8k2

BLOCK DIAGRAM


Line-In
ATTEN
Playback Head
Rec/Pb Head
Erase Head
7710
SOURCE SEL
HEF4952BT
1A0 1A1 1A2
7720
PRE-AMPLIFIER
AN7318S
ALCEN
ALC
Rec current
PLAYBACK EQUALISATION
7740
PB EQN. SW.
HEF4952BT
2A0 2A1 2A2
4794 #
9792 #
ATTEN
PB Out
For Dolby version only
PB In
7630
DOLBY B NR
CXA1101M
PB Out
REC Out
Rec In
PB A ADJ
1A0
PB B ADJ
1A1
DOLBY
2A2
MUTE
7788
2A2
MPX
BIAS SYM
HD SW.
REC
IEC I IEC II
REC EQN.
7640
RECORD AMP
NJM4560D
REC ADJ
7730
REC EQN. SW.
HEF4952BT
3A0 3A1 3A2
(HS) (REC) (CRB)
#
NOM/HI SPEED
REC EQN.
NOM/HI SPEED
REC EQN.
3A0 NS
BIAS ADJ
Bias
Erase
OSCILLATOR
REC CRB


1A0
REC
7787
ALCEN
1A2
7780
7791
1A1
CRA
7792
2A0
NS/HS
(NS)
7622
HS
3A0


Deck B (Rec/Pb) switches, sensors & motor
SOLENOID SUPPLY CTRL
SOLENOID SUPPLY CTRL
MOTOR VCC SUPPLY CTRL
NS/HS CTRL
4x
DECK(S) SW. STATUS TO VOLTS CONV.
2x
AD1 AD2
Deck A (Pb) switches, sensors & motor
CLK
DATA
STROBE
7610
SHIFT REGISTER
HEF4094BT
1A0
2A1
2A2
REC
NS/HS (NS)

NOTE: # For Non-dolby version only
Only 1 channel is presented.

▯▯⇨ MicroProcessor Control / Communication lines

⇨ Direct / Indirect Control lines from Shift Registers

Brief introduction

General

1. Playback Mode

   Signal from the playback head Deck A or Deck B is selected and fed through by the Mode Selector IC7710 (HEF4952B). The signal is amplified by amplifier IC7720 (AN7318S) before feeding to the IC7740 (HEF4952B) and out to the AF Board via connector 1701. For Dolby sets the signal from IC7740 will pass through IC7630 (CXA1551M) for dolby noise processing before going to the connector 1701.

2. Recording Mode

   Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952B) which is then amplified by the amplifier IC7720 (AN7318S). The amplified output signal will pass through IC7730 (HEF4952B) for record equalization and back to IC7710 (HEF4952B) before registered into the Rec/PB Head of Deck B. For Dolby sets the amplified wll pass through IC7630 (CXA1551M) for dolby noise processing, amplified to the right level by IC7640 (NJM4560M) before record equalization.

3. Dubbing Mode

   In Dubbing mode, signal from the playback head Deck A is selected and fed through by the Mode Selector IC7710 (HEF4952B) which is then equalised for playback mode by the amplifier IC7720 (AN7318S) so that a flat response is obtained after the pre-amp. The equalised signal will then follow the same path as in the Recording mode.

4. Mode Selector

   The Mode Selector IC7710 (HEF4952B) caters for 4 inputs signal, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal and Dubbing Signal.

5. Amplifier PB/REC

   Amplifier IC7720 (AN7318S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.

6. Automatic Level Control (ALC)

   ALC circuit consists of resistors (3760, 3765, 3766, 3767), capacitors (2762, 2763) and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.

7. Muting Circuit (For Non-Dolby only)

   Switch S4 of the IC7740 (HEF4952B) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.

8. IC7740 (HEF4952B)

   The function of the IC7740 (HEF4952B) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II) during playback mode. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the Recording mode.

9. IC7730 (HEF4952B)

   The function of the IC7730 (HEF4952B) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II).

10. Bias Level

    Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.

11. Bias Symm (For Dolby only)

    Bias Symm making use of the Variable resistor (3785) to adjust the bias current for the left and the right channel to be equal.

12. PB Switch

    Playback Switch which consists of the FETs 7785 (For Dolby only) & 7786 (J111) is for the purpose of providing a virtual ground for the Rec/PB Head (Deck B) during Playback mode. During the Playback mode, the FETs are turn on and shorted pin 2 and 4 of connector 1720 to the ground. During Recording mode, the FETs are turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.

13. Muting Circuit

    The muting circuit which consists of transistors 7788, 7789 and 7790 (BC847B) is for the purpose of muting the output during Recording mode.

14. Motor Speed

    During High speed dubbing, a feedback signal from the uP through pin 03 of the IC7610 (HEF4094BT) will trigger the transistors 7622 (BC847B) and 7616 (BC857B) to cause a change in the voltage level between High and Low, thus changing the speed of the motor.

15. IC7610 (HEF4094BT)

    IC7610 (HEF4094BT) is a Shift Register use for issues the logic for cmos switch ICs (HEF4952B) via 1A0, 2A1 and 2A2. It also issues logic to On/Off SOL_A, SOL_B and MOT. Recording speed is controlled via NS/HS.

Dolby Circuit (For sets with Dolby B NR only)

16. IC7630 (CXA1551M)

    IC7630 (CXA1551M) in the Dolby circuit is a Dolby Noise Reduction Type B IC for the Playback and Recording signal. Noise Reduction ON/OFF are controlled by $\overline{\text{DOLBY}}$, which is from CLK, direct from uP. After clocking in DATA, CLK is set to HIGH/LOW for NR OFF/ON.

17. 19kHz Filter

    The 19kHz filters 5631 & 5632 (LXD-210) in the Dolby circuit is for the purpose of filtering the 19kHz Pilot Tone (for Tuner signal only) of the Recording signal.

18. Level Adjust

    The Variable resistor 3635, 3636,3641 and 3642 in the Dolby circuit is for adjusting the playback level of the Dolby reference (400Hz , 200nWb/m). Transistor 7631, 7632 are ON to enable adjustment of 3641, 3642 during Playback Deck A. Transistor 7633, 7634 and 3635, 3636 are active for Playback Deck B.

19. Amplifier IC7640 (NJM4560M)

    The Amplifiers 7640A & 7640B (NJM4560M) in the Dolby circuit is for the purpose of amplified the Recording signal.

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

CR	Chrome (IEC type II)
DB	Dolby NR type B
DD	Double Deck
DM	Double Motor
FE	Ferro (IEC type I)
FF	Non Auto Reverse
FR	Auto Reverse on Deck B
Gnd x	Ground x
HSD	High speed dubbing
ND	Non Dolby
NR	Noise Reduction
NSD	Normal speed dubbing
PB	Playback
REC	Record
S/A	Sub-assy
SD	Single Deck
SM	Single Motor

CONNECTORS ASSIGNMENTS:

CONNECTOR 1701 — INTERCONNECTION TO AF BOARD

○	1	REC-L	Record input left
○	2	REC-R	Record input right
○	3	GND A	AF Ground
○	4	TAPE-L	Playback output left
○	5	+12V	D.C. supply (+12V) in
○	6	TAPE-R	Playback output right
○	7	-CMOS	Negative d.c. supply (-9V) for CMOS ICs

CONNECTOR 1703 — INTERCONNECTION TO AF BOARD

○	1	GND M	Motor Ground
○	2	+MOTOR	D.C. supply (+12V) for tape deck motor & solenoid

CONNECTOR 1706 — INTERCONNECTION TO FRONT BOARD

○	1	AD2	Deck sensing switches output voltage / Deck A EOT
○	2	AD1	Deck sensing switches output voltage / Deck B EOT
○	3	+5	DC supply +5V for ADC network
○	4	GND P	Control & Oscillator Ground
○	5	CLK	HEF4094BT shift register Clock line
○	6	DATA	HEF4094BT shift register Data line
○	7	STROBE	HEF4094BT shift register Strobe line

CONNECTOR 1710 — DECK B HEADS CONNECTON *(For ETF6... only)*

○	1	B R/P HD L+	R/P Head left channel positive
○	2	GND A	R/P Head return ground
○	3	B R/P HD R+	R/P Head right channel positive
○	4	ERASE HEAD	Erase Head
○	5	GND A	Erase Head ground

CONNECTOR 1720 — DECK B HEADS CONNECTON *(For ETF5... only)*

○	1	B R/P HD L+	R/P Head left channel positive
○	2	B R/P HD L-	R/P Head left channel negative
○	3	B R/P HD R+	R/P Head right channel positive
○	4	B R/P HD R-	R/P Head right channel negative
○	5	ERASE HEAD	Erase Head
○	6	GND A	Erase Head ground

CONNECTOR 1730 — DECK A HEAD CONNECTIONS *(For Double Deck versions only)*

○	1	A PB HD L+	Pb Head left channel positive
○	2	GND A	Pb Head return ground shield
○	3	A PB HD R+	Pb Head right channel positive

CONNECTOR 1740 — DECK B CONTROL INTERFACE *(For ETF5... Double Deck only)*

○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	3	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply	
○	6	Vcc	Deck / Motor supply	
○	7	MODE	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	
○	9	H	H pin for motor	
○	10	L	L pin for motor	

CONNECTOR 1750 — DECK A CONTROL INTERFAC *(For ETF5... Double Deck only)*

○	1	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
○	2	PHOTO A	Photo sensor output (tape movement indication)	
○	3	SOL A	Solenoid supply	
○	4	Vcc	Deck/Motor supply	
○	5	MODE	Mode switch (head engagement)	[open=off: close=engaged]
○	6	GND M	Deck/Motor ground	

CONNECTOR 1760 — DECK B CONTROL INTERFACE *(For Single Deck only)*

○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	3	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply	
○	6	Vcc	Deck / Motor supply	
○	7	MODE	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	

CONNECTOR 1770 — DECK A & B CONTROL INTERFACE *(For ETF6... only)*

○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	3	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid supply for deck B	
○	6	Vcc	Deck / Motor supply	
○	7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
○	8	GND M	Deck / Motor ground	
○	9	L	L pin for motor	
○	10	H	H pin for motor	
○	11	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
○	12	SOL A	Solenoid supply for deck A	
○	13	PHOTO A	Photo sensor output (tape movement indication)	

TAPE MECHANISM ELECTRONICS

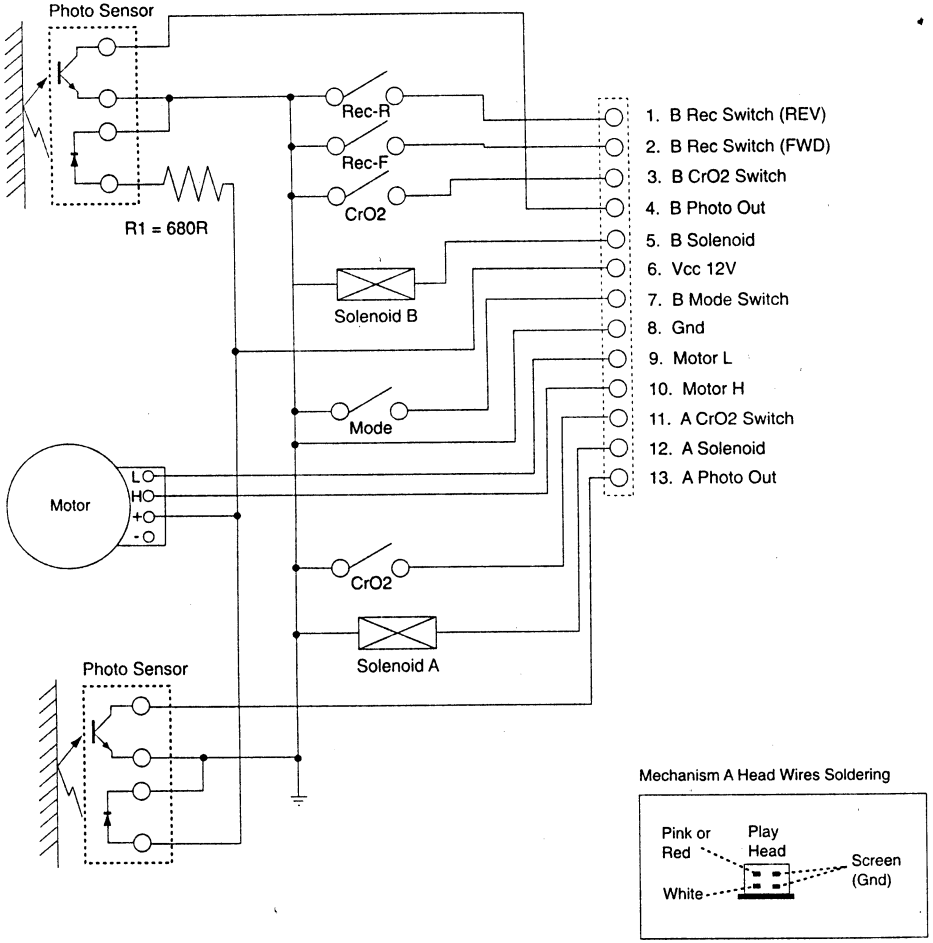
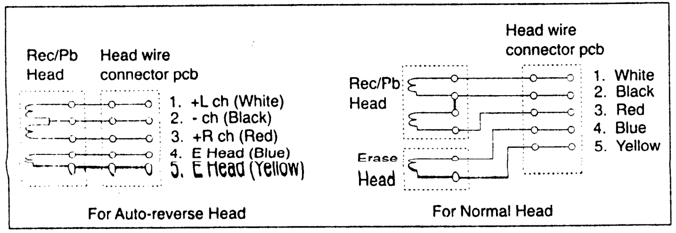


Photo Sensor
Rec-R
Rec-F
CrO2
R1 = 680R
Solenoid B
Mode
Motor
L
H
+
-
CrO2
Solenoid A
Photo Sensor
1. B Rec Switch (REV)
2. B Rec Switch (FWD)
3. B CrO2 Switch
4. B Photo Out
5. B Solenoid
6. Vcc 12V
7. B Mode Switch
8. Gnd
9. Motor L
10. Motor H
11. A CrO2 Switch
12. A Solenoid
13. A Photo Out
Pink or Red
White
Play Head
Screen (Gnd)

Mechanism A Head Wires Soldering

Mechanism B Head Wires Soldering


Rec/Pb Head
Head wire connector pcb
1. +L ch (White)
2. - ch (Black)
3. +R ch (Red)
4. E Head (Blue)
5. E Head (Yellow)
For Auto-reverse Head
Rec/Pb Head
Erase Head
Head wire connector pcb
1. White
2. Black
3. Red
4. Blue
5. Yellow
For Normal Head

TAPE ADJUSTMENT & CHECK TABLE

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	ADJUST to
ADJUST MOTOR SPEED						
NORMAL SPEED	SBC420 3150Hz	PLAY B	1 or 2 LEFT RIGHT	frequency counter	3620	3150Hz ± 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 3150Hz	PLAY	1 or 2 LEFT RIGHT	W&F-meter	check	≤0.4 % DIN
ADJUST AZIMUTH						
DECK A & B	SBC420 10kHz	PLAY FWD	1 or 2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	
CHECK PLAYBACK FREQUENCY RESPONSE						
DECK A & B	SBC420	PLAY	1 or 2 LEFT RIGHT	mV-meter	check	limits see fig.1
ADJUST BIAS CURRENT						
DECK B	SBC419A	RECORD	5 or 6 LEFT RIGHT	mV-meter	3773	995mV
	SBC420				check	750mV ± 1.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via 3 or 4	SBC419A or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	1 or 2 LEFT RIGHT	mV-meter	check	limits see fig. 2 *
Inject 1kHz 8.85mV via 3 or 4	SBC419A or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	1 or 2 LEFT RIGHT	THD-meter	check	≤3% *

SBC419A : 4822 397 30069
SBC420 : 4822 397 30071

# For Auto-reverse version only
* If high frequencies are not within limits, decrease bias and re-measure.
If distortion is too high, increase bias and re-meaure

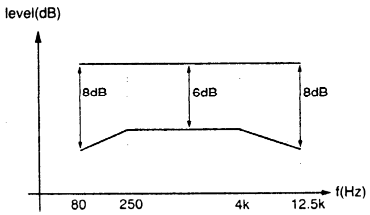


figure. 1

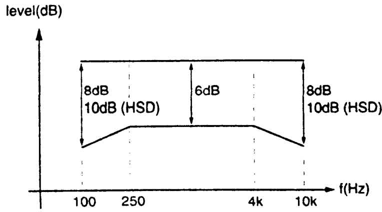
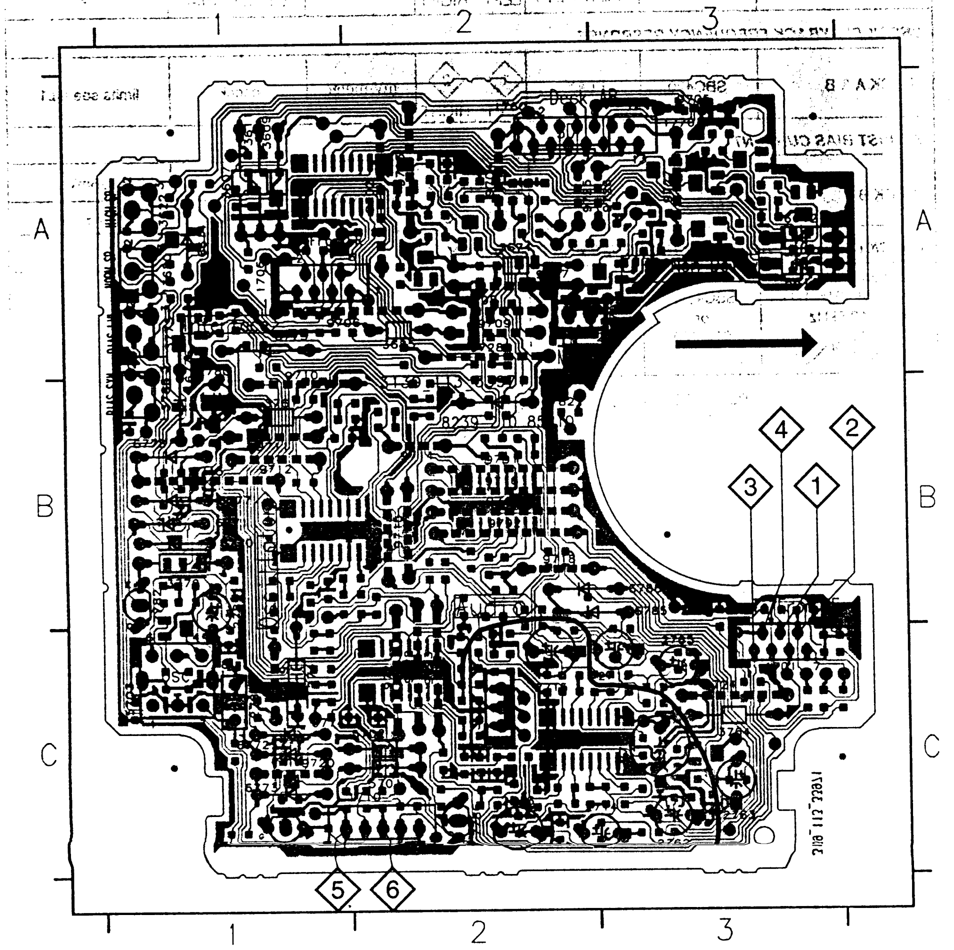


figure. 2

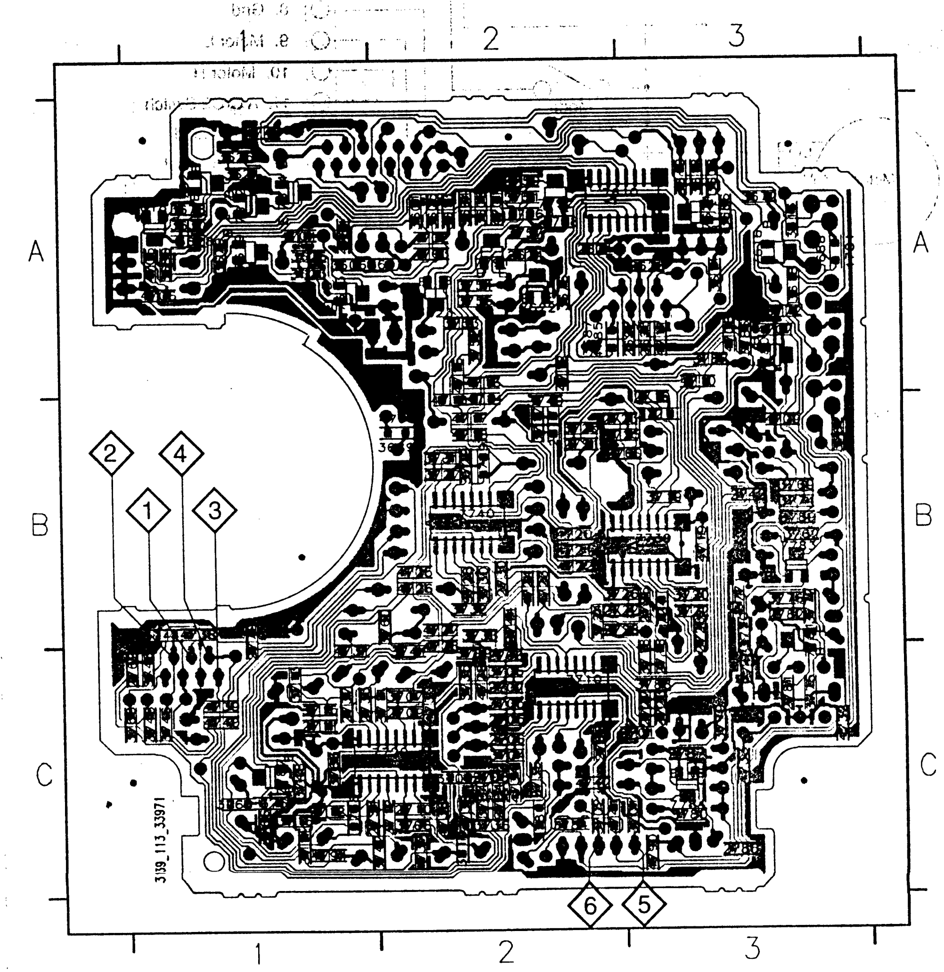
COMPONENT LAYOUT

1701	C3	2716	C2	3609	A1	3785	B1	6773	C1	7785	C1	9710	A1	9720	C1	9792	B2
1703	A3	2741	C1	3611	A1	5701	C2	6774	C1	7786	C2	9711	B1	9721	C2	9793	B2
1706	A1	2761	C3	3620	A1	5702	C2	6775	A1	9702	A2	9712	B1	9722	C2		
1710	C2	2762	C3	3622	A1	5703	C1	6776	A1	9703	A2	9713	B1	9723	C2		
1730	C2	2763	C3	3674	A2	6611	A3	6777	B1	9704	A2	9714	B2	9724	C3		
1760	A2	2765	C3	3685	A2	6612	A3	6778	B1	9705	A3	9715	B2	9725	A2		
1770	A3	2780	A1	3761	B1	6614	A1	6782	B2	9706	A1	9716	B2	9726	A3		
2713	C3	2784	C1	3764	C3	6770	B1	6785	B3	9707	A2	9717	B2	9727	A3		
2714	C3	2785	B1	3773	A1	6771	B1	6786	B3	9708	A2	9718	B2	9728	A2		
2715	C2	3607	A1	3778	B1	6772	C1	7782	B1	9709	A2	9719	C1	9791	B2		

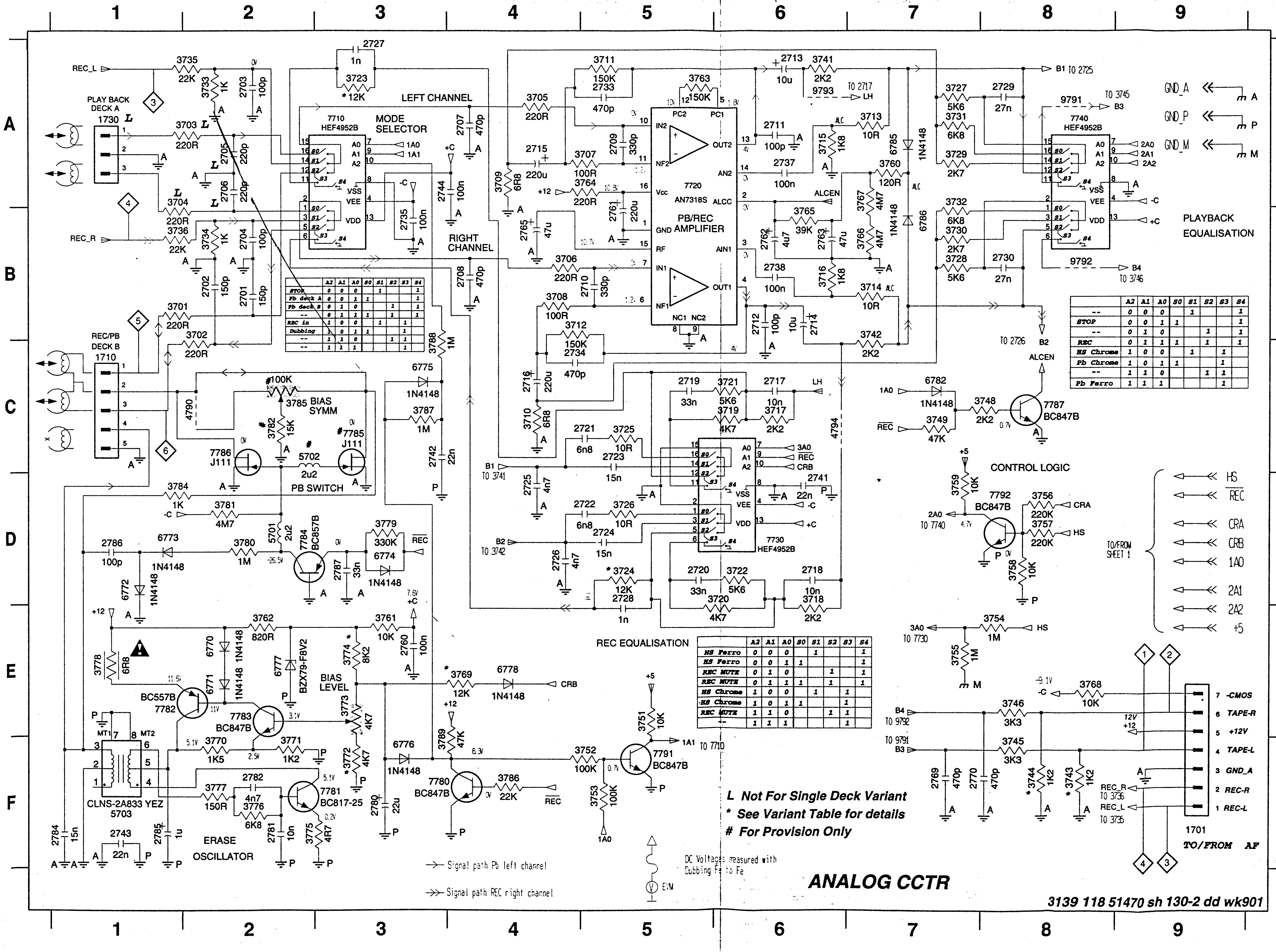


CHIP LAYOUT

2621	A2	2725	B3	3605	A2	3702	C2	3727	B2	3758	A2	3789	B3	4725	B2	7610	A3
2622	A3	2726	B3	3606	A1	3703	C2	3728	B2	3759	A2	4701	A2	4726	B2	7612	A1
2623	A3	2727	C3	3608	A3	3704	C2	3729	B2	3760	B2	4702	A2	4727	B2	7613	A1
2624	A2	2728	B2	3610	A3	3705	C2	3730	B2	3762	B3	4703	A2	4728	C2	7614	A1
2625	A3	2729	B2	3612	A3	3706	C2	3731	B2	3763	C1	4704	A1	4729	C2	7616	A3
2701	C3	2730	B2	3613	A2	3707	C2	3732	B2	3765	C1	4705	A1	4730	C2	7618	A1
2702	C2	2733	C1	3614	A3	3708	C2	3733	B2	3766	C1	4706	A1	4731	C1	7619	A1
2703	C2	2734	C1	3616	A3	3709	C2	3734	C2	3767	C1	4707	A3	4732	C3	7620	A1
2704	C2	2735	C2	3618	A3	3710	C2	3735	C2	3768	C1	4708	A3	4733	C3	7622	A2
2705	C2	2737	C1	3623	A1	3711	C2	3736	C2	3769	B3	4709	B3	4734	C2	7623	A2
2706	C2	2738	C1	3624	A1	3712	C2	3741	C2	3770	B3	4710	A3	4735	C2	7624	A3
2707	C2	2742	B3	3625	A1	3713	C1	3742	C1	3771	B3	4711	A3	4736	C2	7710	C2
2708	C2	2743	C3	3626	A1	3714	C1	3743	C1	3772	A3	4712	A2	4737	C2	7720	C2
2709	C2	2744	B2	3628	A1	3715	C1	3744	B1	3774	B3	4713	A2	4738	B1	7730	B3
2710	C2	2760	B3	3630	A1	3716	C1	3745	C1	3775	C3	4714	B2	4739	C1	7740	B2
2711	C1	2769	C1	3672	A3	3717	B2	3746	C1	3776	B3	4715	A2	4740	C1	7780	A3
2712	C1	2770	B1	3676	A2	3718	C3	3748	C1	3777	B3	4716	B2	4741	C2	7781	B3
2717	B2	2781	C3	3678	A1	3719	B3	3749	B2	3779	C3	4717	B2	4742	C2	7783	B3
2718	C3	2782	B3	3679	A1	3720	B3	3751	A2	3780	C3	4718	B2	4743	A1	7784	C3
2719	B3	2786	C3	3680	A1	3721	B3	3752	A2	3781	C2	4719	B3	4781	A3	7787	C1
2720	B3	2787	C3	3686	A3	3722	B3	3753	A2	3782	B3	4720	B2	4784	A1	7791	A2
2721	B2	3601	A2	3687	A2	3723	C3	3754	A2	3784	C2	4721	B2	4785	A2	7792	A2
2722	B2	3602	A2	3688	A3	3724	B2	3755	A2	3786	A3	4722	B2	4790	C3		
2723	B2	3603	A2	3689	B2	3725	B2	3756	A2	3787	A3	4723	B2	4794	C1		
2724	B3	3604	A2	3701	C3	3726	B2	3757	A2	3788	C3	4724	B2	4795	B2		



ANALOG CIRCUIT


REC_L
REC_R
PLAY BACK DECK A 1730
REC/PB DECK B 1710
7710 HEF4952B MODE SELECTOR
LEFT CHANNEL
RIGHT CHANNEL
7720 AN7318S PB/REC AMPLIFIER
7730 HEF4952B
REC EQUALISATION
7740 HEF4952B
PLAYBACK EQUALISATION
CONTROL LOGIC
ALCEN
3785 BIAS SYMM
PB SWITCH
BIAS LEVEL
ERASE OSCILLATOR
CLNS-2A833 YEZ 5703
TO/FROM SHEET 1
GND_A
GND_P
GND_M
1701 TO/FROM AF
7 -CMOS
6 TAPE-R
5 +12V
4 TAPE-L
3 GND_A
2 REC-R
1 REC-L
Signal path Pb left channel
Signal path REC right channel
DC Voltages measured with Dubbing Fe to Fe

	A2	A1	A0	S0	S1	S2	S3	S4
STOP	0	0	0		1			1
Pb deck A	0	0	1	1				1
Pb deck B	0	1	0			1		1
--	0	1	1	1		1		1
REC in	1	0	0		1		1	
Dubbing	1	0	1	1			1	
--	1	1	0			1	1	
--	1	1	1				1	

	A2	A1	A0	S0	S1	S2	S3	S4
--	0	0	0		1			1
STOP	0	0	1	1				1
--	0	1	0			1		1
REC	0	1	1	1		1		1
HS Chrome	1	0	0		1		1	
Pb Chrome	1	0	1	1			1	
--	1	1	0			1	1	
Pb Ferro	1	1	1				1	

	A2	A1	A0	S0	S1	S2	S3	S4
NS Ferro	0	0	0		1			1
HS Ferro	0	0	1	1				1
REC MUTE	0	1	0			1		1
REC MUTE	0	1	1	1		1		1
NS Chrome	1	0	0		1		1	
HS Chrome	1	0	1	1			1	
REC MUTE	1	1	0			1	1	
--	1	1	1				1	

L Not For Single Deck Variant
** See Variant Table for details*
# For Provision Only

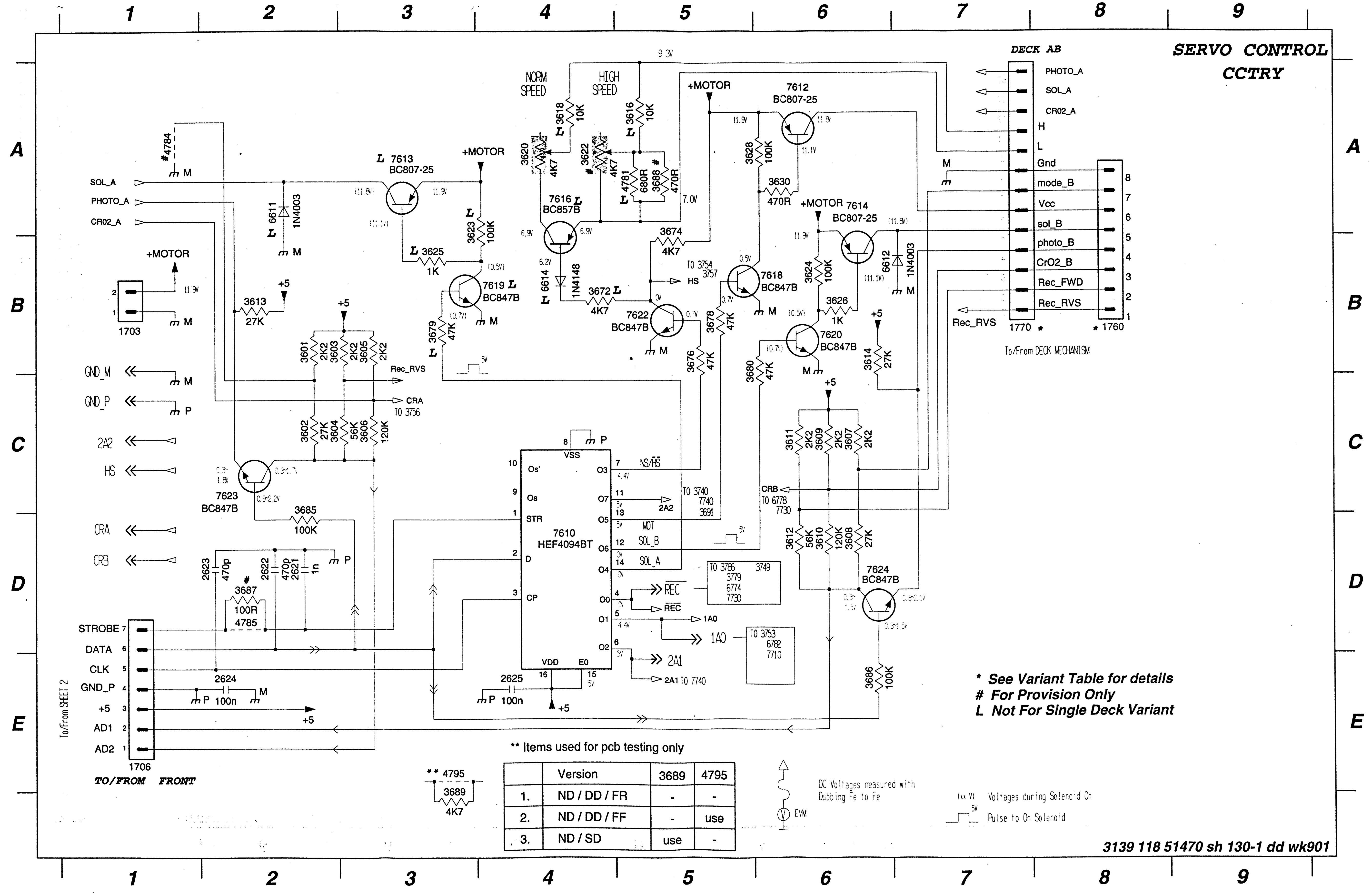
ANALOG CCTR

3139 118 51470 sh 130-2 dd wk901

1701	F9
1710	C1
1730	A1
2701	B2
2702	B2
2703	A2
2704	B2
2705	A2
2706	A2
2707	A4
2708	B4
2709	A5
2710	B5
2711	A6
2712	B6
2713	A6
2714	B6
2715	A4
2716	C4
2717	C6
2718	D6
2719	C5
2720	D5
2721	C5
2722	D5
2723	C5
2724	D5
2725	D4
2726	D4
2727	A3
2728	D5
2729	A8
2730	B8
2733	A5
2734	C4
2735	B3
2737	A6
2738	B6
2741	D6
2742	C3
2743	F1
2744	A3
2760	E3
2761	B5
2762	B6
2763	B6
2765	B4
2769	F7
2770	F7
2780	F3
2781	F2
2782	F2
2784	F1
2785	F1
2786	D1
2787	D3
3701	B1
3702	B2
3703	A2
3704	A1
3705	A4
3706	B4
3707	A5
3708	B4
3709	A4
3710	C4
3711	A5
3712	B4
3713	A7
3714	B7
3715	A6
3716	B6
3717	C6
3718	D6
3719	C6
3720	D6
3721	C6
3722	D6
3723	A3
3724	D5
3725	C5
3726	D5
3727	A7
3728	B7
3729	A7
3730	B7
3731	A7
3732	A7
3733	A2
3734	B2
3735	A2
3736	B1
3741	A6
3742	B7
3743	F8
3744	F8
3745	F8
3746	E8
3748	C8
3749	C7
3751	E5
3752	F5
3753	F5
3754	E8
3755	E7
3756	D8
3757	D8
3758	D8
3759	D7
3760	A7
3761	E3
3762	E2
3763	A5
3764	A5
3765	B6
3766	B7
3767	A7
3768	E8
3769	E4
3770	F2
3771	F2
3772	F3
3773	E3
3774	E3
3775	F2
3776	F2
3777	F2
3778	E1
3779	D3
3780	D2
3781	D2
3782	C2
3784	D1
3785	C2
3786	F4
3787	C3
3788	C3
3789	F3
4790	C2
4794	C6
5701	D2
5702	C2
5703	F1
6770	E2
6771	E2
6772	D1
6773	D1
6774	D3
6775	C3
6776	F3
6777	E2
6778	E4
6782	C7
6785	A7
6786	B7
7710	A3
7720	A5
7730	D6
7740	A8
7780	F4
7781	F3
7782	E1
7783	E2
7784	D2
7785	C3
7786	C2
7787	C8
7791	F5
7792	D8
9791	A8
9792	B8
9793	A6

SERVO CONTROL CIRCUIT

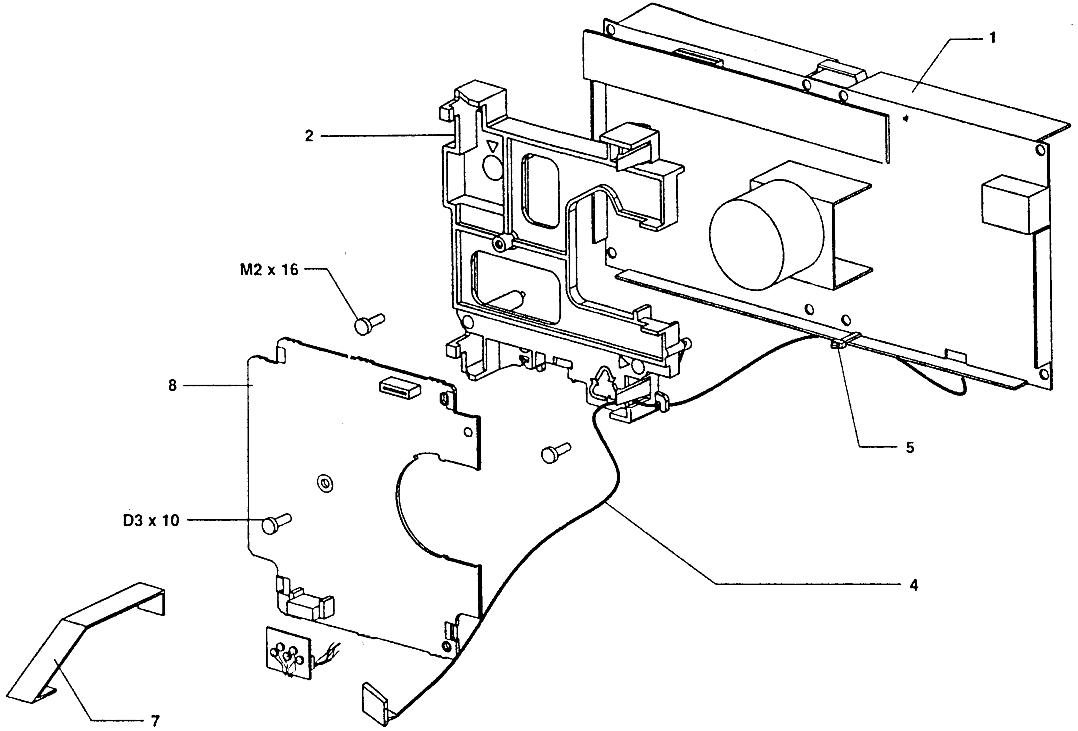
1703 B1
1706 E1
1760 B8
1770 B7
2621 D2
2622 D2
2623 D2
2624 E2
2625 E4
3601 B2
3602 C2
3603 B2
3604 C2
3605 B3
3606 C3
3607 C6
3608 D6
3609 C6
3610 D6
3611 C6
3612 D6
3613 B2
3614 B6
3616 A5
3618 A4
3620 A4
3622 A4
3623 A3
3624 B6
3625 B3
3626 B6
3628 A5
3630 A6
3672 B4
3674 A5
3676 B5
3678 B5
3679 B3
3680 B5
3685 C2
3686 E6
3687 D2
3688 A5
3689 E3
4781 A5
4784 A1
4785 D2
4795 E3
6611 A2
6612 B6
6614 B4
7610 D4
7612 A6
7613 A3
7614 A6
7616 A4
7618 B6
7619 B4
7620 B6
7622 B5
7623 C2
7624 D6


SERVO CONTROL CCTRY
1
2
3
4
5
6
7
8
9
A
B
C
D
E
DECK AB
PHOTO_A
SOL_A
CR02_A
H
L
Gnd
mode_B
Vcc
sol_B
photo_B
CrO2_B
Rec_FWD
Rec_RVS
1770 *
* 1760
To/From DECK MECHANISM
9.3V
NORM SPEED
HIGH SPEED
+MOTOR
7612 BC807-25
7613 BC807-25
7614 BC807-25
7616 BC857B
7618 BC847B
7619 BC847B
7620 BC847B
7622 BC847B
7623 BC847B
7624 BC847B
7610 HEF4094BT
6611 1N4003
6612 1N4003
6614 1N4148
3618 10K
3616 10K
3620 4K7
3622 4K7
4781 680R
3688 470R
3628 100K
3630 470R
3674 4K7
3623 100K
3625 1K
3672 4K7
3624 100K
3626 1K
3613 27K
3614 27K
3679 47K
3678 47K
3676 47K
3680 47K
3601 2K2
3603 2K2
3605 2K2
3602 27K
3604 56K
3606 120K
3611 2K2
3609 2K2
3607 2K2
3612 56K
3610 120K
3608 27K
3686 100K
3685 100K
3687 100R
4785
2623 470p
2622 470p
2621 1n
2624 100n
2625 100n
4784
1703
TO 3754 3757
HS
Rec_RVS
CRA
TO 3756
GND_M
GND_P
2A2
HS
CRA
CRB
CRB
TO 6778 7730
NS/HS
TO 3740 7740 3691
MOT
SOL_B
SOL_A
REC
TO 3786 3749 3779 6774 7730
1A0
TO 3753 6782 7710
2A1
2A1 TO 7740
STROBE
DATA
CLK
GND_P
+5
AD1
AD2
1706
To/From SHEET 2
TO/FROM FRONT
** 4795
3689 4K7
DC Voltages measured with Dubbing Fe to Fe
EVM
(xx V) Voltages during Solenoid On
5V Pulse to On Solenoid
3139 118 51470 sh 130-1 dd wk901

* See Variant Table for details
# For Provision Only
L Not For Single Deck Variant

** Items used for pcb testing only

	Version	3689	4795
1.	ND / DD / FR	-	-
2.	ND / DD / FF	-	use
3.	ND / SD	use	-


1
2
M2 x 16
8
D3 x 10
5
4
7

ETF6 TAPE MODULE EXPLODED VIEW

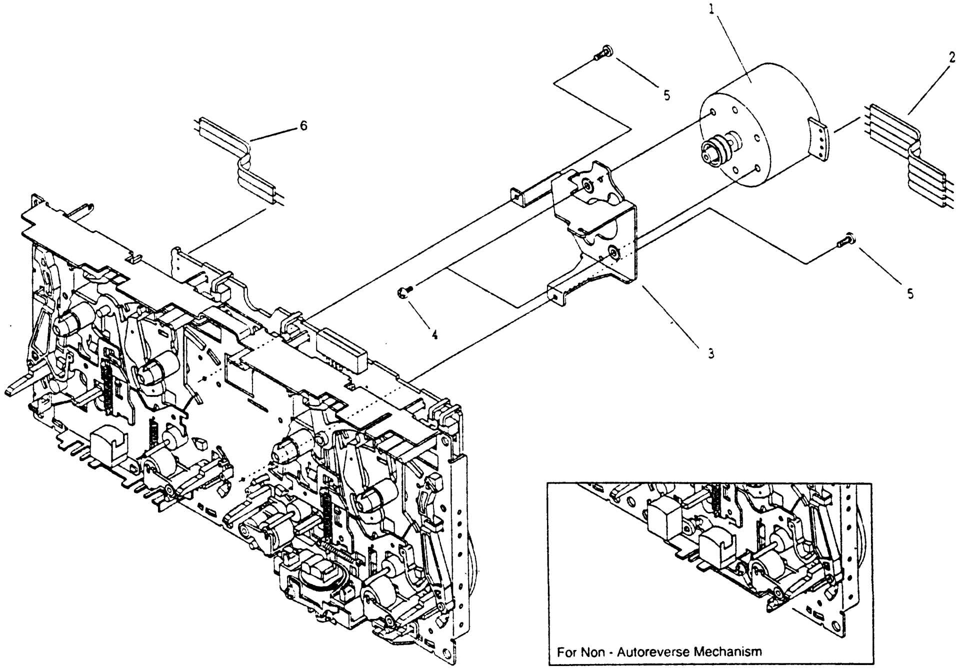
1	4822 691 10673	Autoreverse Mech. CWC44FR02
1	4822 691 10672	Non-Autoreverse Mech. CWC44FF01
7	4822 320 12245	Flex Cable 13 pin 7,5 cm

Note: Only the parts mentioned in this list are normal service spare parts.

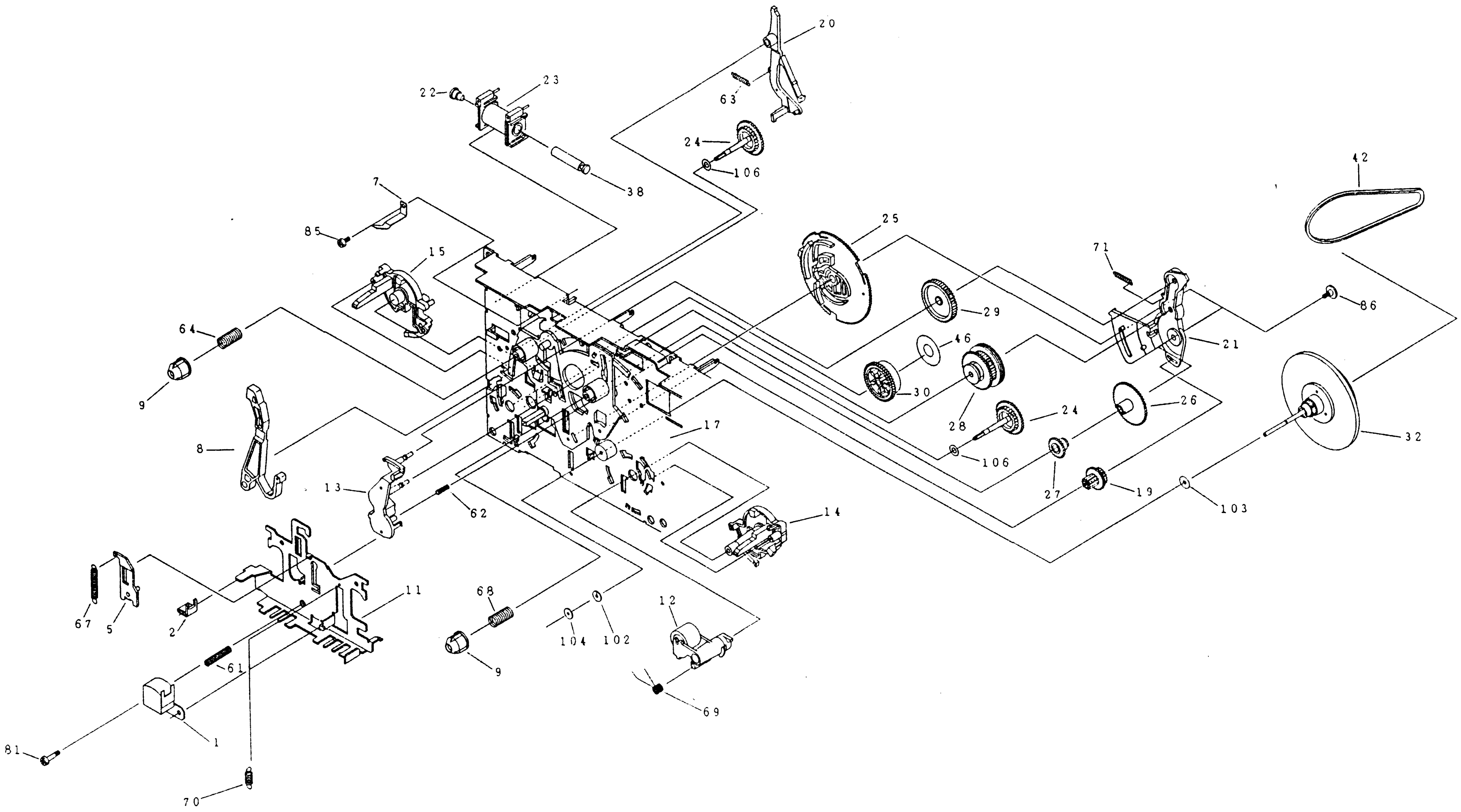
TAPE MECHANISM - MOTOR EXPLODED VIEW

1	4822 361 11055	Motor Assembly
4	-	Screw M2,6 x 4
5	-	Screw M2 x 3

Note: Only the parts mentioned in this list are normal service spare parts.


1
2
5
6
5
4
3
For Non - Autoreverse Mechanism

TAPE MECHANISM A - PLAY


20
23
22
63
24
106
38
7
85
42
25
71
15
29
86
64
46
21
9
30
26
28
24
17
8
32
106
13
27
19
103
62
14
11
68
12
67
5
2
104
102
61
9
69
1
81
70

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10397	MS15RAA2N1
12	4822 402 10972	Pinch Arm Assembly Right
23	4822 157 11498	Coil Assembly
32	4822 528 11244	Flywheel Assembly RV
42	4822 358 10168	Belt AF
69	4822 492 11542	Spring
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer

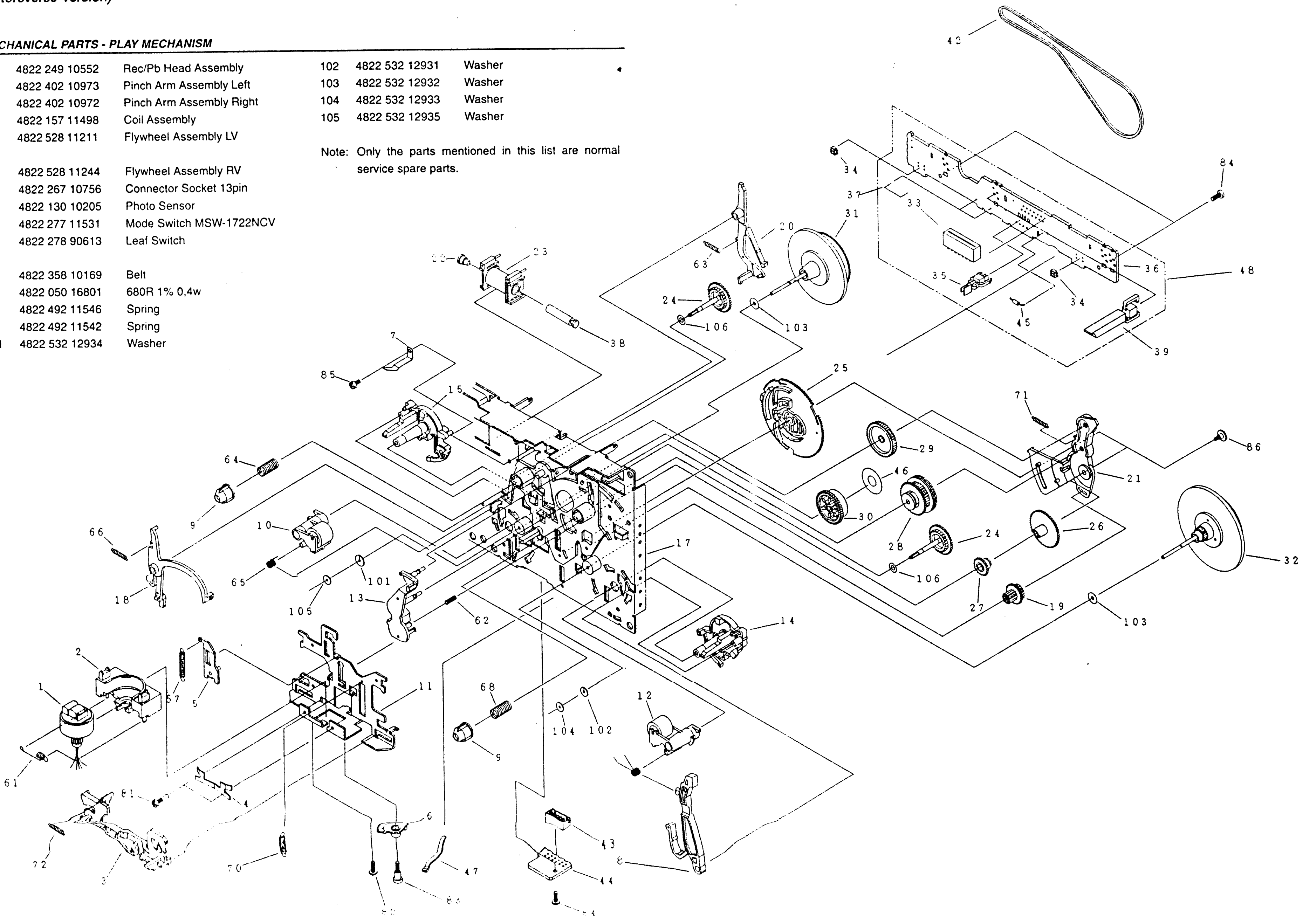
Note: Only the parts mentioned in this list are normal service spare parts.

TAPE MECHANISM B - RECORD/PLAYBACK
(Autoreverse Version)

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10552	Rec/Pb Head Assembly
10	4822 402 10973	Pinch Arm Assembly Left
12	4822 402 10972	Pinch Arm Assembly Right
23	4822 157 11498	Coil Assembly
31	4822 528 11211	Flywheel Assembly LV
32	4822 528 11244	Flywheel Assembly RV
33	4822 267 10756	Connector Socket 13pin
34	4822 130 10205	Photo Sensor
35	4822 277 11531	Mode Switch MSW-1722NCV
39	4822 278 90613	Leaf Switch
42	4822 358 10169	Belt
45	4822 050 16801	680R 1% 0,4w
65	4822 492 11546	Spring
69	4822 492 11542	Spring
101	4822 532 12934	Washer
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer
105	4822 532 12935	Washer

Note: Only the parts mentioned in this list are normal service spare parts.


42
84
34
37
33
31
20
36
48
35
34
45
39
63
24
106
103
23
38
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85
15
25
71
86
29
46
21
30
28
24
26
32
106
27
19
103
64
9
10
66
17
101
65
105
13
18
62
14
2
1
67
5
11
68
104
102
12
9
61
81
4
6
72
3
70
47
43
44
8

PCS 100 009

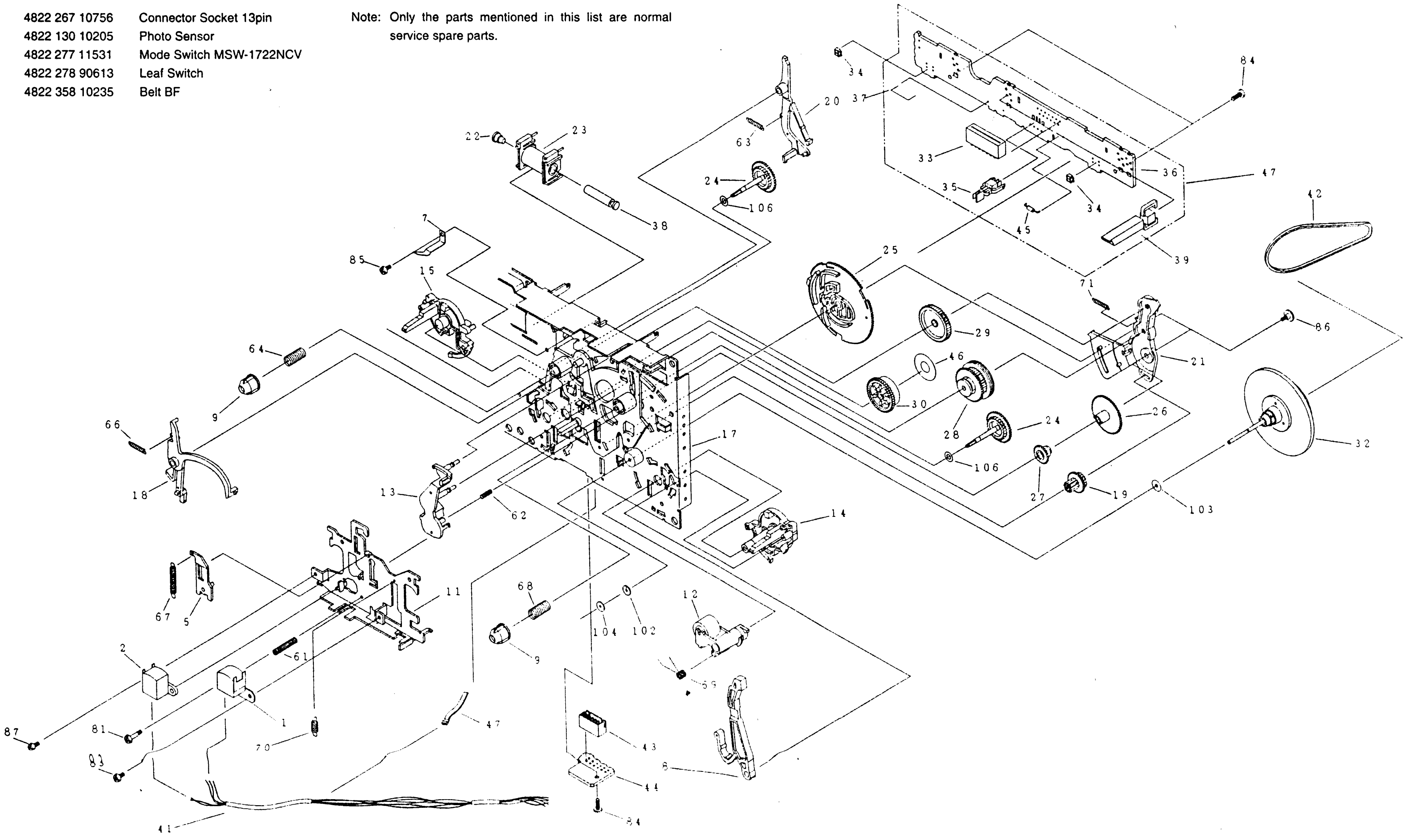
TAPE MECHANISM B - RECORD/PLAYBACK

(Non-Autoreverse Version)

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10397	Rec/Pb Head Assembly
2	4822 249 40303	Erase Head
12	4822 402 10972	Pinch Arm Assembly Right
23	4822 157 11498	Coil Assembly
32	4822 528 11244	Flywheel Assembly RV
33	4822 267 10756	Connector Socket 13pin
34	4822 130 10205	Photo Sensor
35	4822 277 11531	Mode Switch MSW-1722NCV
39	4822 278 90613	Leaf Switch
42	4822 358 10235	Belt BF
45	4822 050 16801	680R 1% 0,4w
69	4822 492 11542	Spring
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer

Note: Only the parts mentioned in this list are normal service spare parts.


84
34
20
37
63
22
23
33
36
47
42
24
106
35
34
45
38
39
7
85
15
25
71
29
86
46
21
64
30
9
28
24
26
66
17
32
18
106
13
62
27
19
103
14
11
67
5
68
104
102
12
2
61
9
59
87
81
1
70
47
83
43
8
44
41
84

ELECTRICAL PARTS LIST - ETF6-FE NON-DOLBY BOARD

MISCELLANEOUS

1701	4822 267 10953	Flex Socket 7P Vert.
1706	4822 267 10953	Flex Socket 7P Vert.
1770	4822 267 10738	Flex Socket 13P Vert.

CAPACITORS

2621	5322 122 34123	1nF 10% 50V
2622	5322 122 34099	470pF 10% 63V
2623	5322 122 34099	470pF 10% 63V
2624	4822 126 13196	100nF 10% 25V
2625	4822 126 13196	100nF 10% 25V
2701	5322 122 33538	150pF 2% 63V
2702	5322 122 33538	150pF 2% 63V
2703	5322 122 32531	100pF 5% 50V
2704	5322 122 32531	100pF 5% 50V
2705	4822 122 33575	220pF 5% 50V
2706	4822 122 33575	220pF 5% 50V
2707	5322 122 34099	470pF 10% 63V
2708	5322 122 34099	470pF 10% 63V
2709	5322 122 31863	330pF 5% 50V
2710	5322 122 31863	330pF 5% 50V
2711	5322 122 32531	100pF 5% 50V
2712	5322 122 32531	100pF 5% 50V
2713	4822 124 41579	10μF 20% 50V
2714	4822 124 41579	10μF 20% 50V
2715	4822 124 40196	220μF 20% 16V
2716	4822 124 40196	220μF 20% 16V
2717	4822 122 33177	10nF 20% 50V
2718	4822 122 33177	10nF 20% 50V
2719	4822 126 12105	33nF 5% 63V
2720	4822 126 12105	33nF 5% 63V
2721	5322 122 31866	6,8nF 10% 63V
2722	5322 122 31866	6,8nF 10% 63V
2723	4822 126 13188	15nF 5% 63V
2724	4822 126 13188	15nF 5% 63V
2725	5322 126 10223	4,7nF 10% 63V
2726	5322 126 10223	4,7nF 10% 63V
2727	5322 122 34123	1nF 10% 50V
2728	5322 122 34123	1nF 10% 50V
2729	4822 122 32541	27nF 10% 63V
2730	4822 122 32541	27nF 10% 63V
2733	5322 122 34099	470pF 10% 63V
2734	5322 122 34099	470pF 10% 63V
2735	4822 126 13196	100nF 10% 25V
2737	4822 126 13196	100nF 10% 25V
2738	4822 126 13196	100nF 10% 25V
2741	4822 126 11585	22nF +80/-20% 25V
2742	5322 122 32654	22nF 10% 63V
2743	5322 122 32654	22nF 10% 63V
2744	4822 126 13196	100nF 10% 25V
2760	4822 126 13196	100nF 10% 25V
2761	4822 124 22263	220μF 20% 25V
2762	4822 124 40246	4,7μF 20% 63V
2763	4822 124 40433	47μF 20% 25V
2765	4822 124 40433	47μF 20% 25V
2769	5322 122 34099	470pF 10% 63V
2770	5322 122 34099	470pF 10% 63V
2780	4822 124 81151	22μF 50V
2781	4822 122 33177	10nF 20% 50V
2782	5322 126 10223	4,7nF 10% 63V
2784	4822 121 51305	15nF 10% 50V
2785	4822 124 40242	1μF 20% 63V
2786	5322 122 32531	100pF 5% 50V
2787	4822 126 12105	33nF 5% 63V

RESISTORS

3601	4822 117 11449	2k2 1% 0,1W
3602	4822 051 20273	27k 5% 0,1W
3603	4822 117 11449	2k2 1% 0,1W
3604	4822 117 11148	56k 1% 0,1W
3605	4822 117 11449	2k2 1% 0,1W
3606	4822 051 20124	120k 5% 0,1W
3607	4822 116 52256	2k2 5% 0,5W
3608	4822 051 20273	27k 5% 0,1W
3609	4822 116 52256	2k2 5% 0,5W
3610	4822 051 20124	120k 5% 0,1W
3611	4822 116 52256	2k2 5% 0,5W
3612	4822 117 11148	56k 1% 0,1W
3613	4822 051 20273	27k 5% 0,1W
3614	4822 051 20273	27k 5% 0,1W
3616	4822 117 10833	10k 1% 0,1W
3618	4822 117 10833	10k 1% 0,1W
3620	5322 100 11542	Trimmer 4k7 30% 0,1W
3623	4822 051 20104	100k 5% 0,1W
3624	4822 051 20104	100k 5% 0,1W
3625	4822 051 10102	1k 2% 0,25W
3626	4822 051 10102	1k 2% 0,25W
3628	4822 051 20104	100k 5% 0,1W
3630	4822 051 20471	470R 5% 0,1W
3672	4822 051 20472	4k7 5% 0,1W
3674	4822 116 52283	4k7 5% 0,5W
3676	4822 117 10834	47k 1% 0,1W
3678	4822 117 10834	47k 1% 0,1W
3679	4822 117 10834	47k 1% 0,1W
3680	4822 117 10834	47k 1% 0,1W
3685	4822 116 52234	100k 5% 0,5W
3686	4822 051 20104	100k 5% 0,1W
3701	4822 117 11503	220R 1% 0,1W
3702	4822 117 11503	220R 1% 0,1W
3703	4822 117 11503	220R 1% 0,1W
3704	4822 117 11503	220R 1% 0,1W
3705	4822 117 11503	220R 1% 0,1W
3706	4822 117 11503	220R 1% 0,1W
3707	4822 051 20101	100R 5% 0,1W
3708	4822 051 20101	100R 5% 0,1W

ELECTRICAL PARTS LIST - ETF6-FE NON-DOLBY BOARD

3709	4822 051 20688	6R8 5% 0,1W
3710	4822 051 20688	6R8 5% 0,1W
3711	4822 051 20154	150k 5% 0,1W
3712	4822 051 20154	150k 5% 0,1W
3713	4822 051 20109	10R 5% 0,1W
3714	4822 051 20109	10R 5% 0,1W
3715	4822 051 20182	1k8 5% 0,1W
3716	4822 051 20182	1k8 5% 0,1W
3717	4822 117 11449	2k2 1% 0,1W
3718	4822 117 11449	2k2 1% 0,1W
3719	4822 051 20472	4k7 5% 0,1W
3720	4822 051 20472	4k7 5% 0,1W
3721	4822 051 20562	5k6 5% 0,1W
3722	4822 051 20562	5k6 5% 0,1W
3723	4822 117 11383	12k 1% 0,1W *Autoreverse*
3723	4822 051 20153	15k5%0,1W *Non-Autoreverse*
3724	4822 117 11383	12k 1% 0,1W *Autoreverse*
3724	4822 051 20153	15k5%0,1W *Non-Autoreverse*
3725	4822 051 20109	10R 5% 0,1W
3726	4822 051 20109	10R 5% 0,1W
3727	4822 051 20562	5k6 5% 0,1W
3728	4822 051 20562	5k6 5% 0,1W
3729	4822 117 12955	2k7 1% 0,1W
3730	4822 117 12955	2k7 1% 0,1W
3731	4822 117 11507	6k8 1% 0,1W
3732	4822 117 11507	6k8 1% 0,1W
3733	4822 051 10102	1k 2% 0,25W
3734	4822 051 10102	1k 2% 0,25W
3735	4822 051 20223	22k 5% 0,1W
3736	4822 051 20223	22k 5% 0,1W
3741	4822 117 11449	2k2 1% 0,1W
3742	4822 117 11449	2k2 1% 0,1W
3743	4822 051 20122	1k2 5% 0,1W *Autoreverse*
3743	4822 051 10102	1k2%0,25W *Non-Autoreverse*
3744	4822 051 20122	1k2 5% 0,1W *Autoreverse*
3744	4822 051 10102	1k2%0,25W *Non-Autoreverse*
3745	4822 051 20332	3k3 5% 0,1W
3746	4822 051 20332	3k3 5% 0,1W
3748	4822 117 11449	2k2 1% 0,1W
3749	4822 117 10834	47k 1% 0,1W
3751	4822 117 10833	10k 1% 0,1W
3752	4822 051 20104	100k 5% 0,1W
3753	4822 051 20104	100k 5% 0,1W
3754	4822 051 20105	1M 5% 0,1W
3755	4822 051 20105	1M 5% 0,1W
3756	4822 117 13579	220k 1% 0,1W
3757	4822 117 13579	220k 1% 0,1W
3758	4822 117 10833	10k 1% 0,1W
3759	4822 117 10833	10k 1% 0,1W
3760	4822 051 20121	120R 5% 0,1W
3761	4822 116 83864	10k 5% 0,5W
3762	4822 117 11454	820R 1% 0,1W
3763	4822 051 20154	150k 5% 0,1W
3764	4822 116 83872	220R 5% 0,5W
3765	4822 051 20393	39k 5% 0,1W
3766	4822 051 20475	4M7 5% 0,1W
3767	4822 051 20475	4M7 5% 0,1W
3768	4822 117 10833	10k 1% 0,1W
3769	4822 117 11383	12k 1% 0,1W *Autoreverse*
3769	4822 051 20822	8k2 5% 0,1W *Non-Autoreverse*
3770	4822 117 11139	1k5 1% 0,1W
3771	4822 051 20122	1k2 5% 0,1W
3772	4822 051 20472	4k7 5% 0,1W *Autoreverse*
3772	4822 051 20562	5k6 5% 0,1W *Non-Autoreverse*
3773	5322 100 11542	Trimmer 4k7 30% 0,1W
3774	4822 117 10833	10k 1% 0,1W *Autoreverse*
3774	4822 051 20822	8k2 5% 0,1W *Non-Autoreverse*
3775	4822 051 20478	4R7 5% 0,1W
3776	4822 117 11507	6k8 1% 0,1W
3777	4822 117 10353	150R 1% 0,1W
3778	4822 052 10688 △	6R8 5% 0,33W
3779	4822 051 20334	330k 5% 0,1W
3780	4822 051 20105	1M 5% 0,1W
3781	4822 051 20475	4M7 5% 0,1W
3784	4822 051 10102	1k 2% 0,25W
3786	4822 051 20223	22k 5% 0,1W
3787	4822 051 20105	1M 5% 0,1W
3788	4822 051 20105	1M 5% 0,1W
3789	4822 117 10834	47k 1% 0,1W
4701	4822 051 20008	0R Jumper 0805
4702	4822 051 20008	0R Jumper 0805
4703	4822 051 20008	0R Jumper 0805
4704	4822 051 20008	0R Jumper 0805
4705	4822 051 20008	0R Jumper 0805
4706	4822 051 20008	0R Jumper 0805
4707	4822 051 20008	0R Jumper 0805
4708	4822 051 20008	0R Jumper 0805
4709	4822 051 20008	0R Jumper 0805
4710	4822 051 20008	0R Jumper 0805
4711	4822 051 20008	0R Jumper 0805
4712	4822 051 20008	0R Jumper 0805
4713	4822 051 20008	0R Jumper 0805
4714	4822 051 20008	0R Jumper 0805
4715	4822 051 20008	0R Jumper 0805
4716	4822 051 20008	0R Jumper 0805
4717	4822 051 20008	0R Jumper 0805
4718	4822 051 20008	0R Jumper 0805
4719	4822 051 20008	0R Jumper 0805
4720	4822 051 20008	0R Jumper 0805
4721	4822 051 20008	0R Jumper 0805
4722	4822 051 20008	0R Jumper 0805
4723	4822 051 20008	0R Jumper 0805
4724	4822 051 20008	0R Jumper 0805
4725	4822 051 20008	0R Jumper 0805

ELECTRICAL PARTS LIST - ETF6-FE NON-DOLBY BOARD

RESISTORS

4726	4822 051 20008	0R Jumper 0805
4727	4822 051 20008	0R Jumper 0805
4728	4822 051 20008	0R Jumper 0805
4729	4822 051 20008	0R Jumper 0805
4730	4822 051 20008	0R Jumper 0805
4731	4822 051 20008	0R Jumper 0805
4732	4822 051 20008	0R Jumper 0805
4733	4822 051 20008	0R Jumper 0805
4734	4822 051 20008	0R Jumper 0805
4735	4822 051 20008	0R Jumper 0805
4736	4822 051 20008	0R Jumper 0805
4737	4822 051 20008	0R Jumper 0805
4738	4822 051 20008	0R Jumper 0805
4739	4822 051 20008	0R Jumper 0805
4740	4822 051 20008	0R Jumper 0805
4741	4822 051 20008	0R Jumper 0805
4742	4822 051 20008	0R Jumper 0805
4781	4822 051 20681	680R 5% 0,1W
4785	4822 051 20008	0R Jumper 0805
4790	4822 051 20008	0R Jumper 0805
4794	4822 051 20008	0R Jumper 0805
4795	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5701	4822 157 11477	Coil 2,2µH 5%
5703	4822 156 20946	Oscillator Coil 100kHz

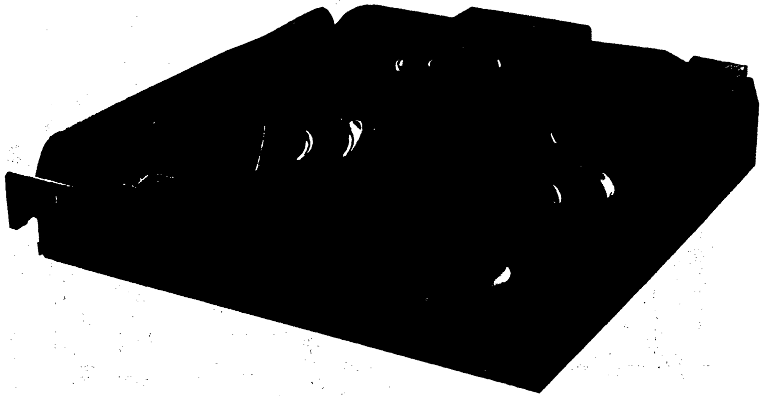
DIODES

6611	4822 130 31878	1N4003G
6612	4822 130 31878	1N4003G
6614	4822 130 30621	1N4148
6770	4822 130 30621	1N4148
6771	4822 130 30621	1N4148
6772	4822 130 30621	1N4148
6773	4822 130 30621	1N4148
6774	4822 130 30621	1N4148
6775	4822 130 30621	1N4148
6776	4822 130 30621	1N4148
6777	4822 130 34382	BZX79-B8V2
6778	4822 130 30621	1N4148
6782	4822 130 30621	1N4148
6785	4822 130 30621	1N4148
6786	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7610	5322 209 11306	HEF4094BT
7612	5322 130 60845	BC807-25
7613	5322 130 60845	BC807-25
7614	5322 130 60845	BC807-25
7616	5322 130 60508	BC857B
7618	4822 130 60511	BC847B
7619	4822 130 60511	BC847B
7620	4822 130 60511	BC847B
7622	4822 130 60511	BC847B
7623	4822 130 60511	BC847B
7624	4822 130 60511	BC847B
7710	4822 209 32919	HEF4952BT
7720	4822 209 32918	AN7318S
7730	4822 209 32919	HEF4952BT
7740	4822 209 32919	HEF4952BT
7780	4822 130 60511	BC847B
7781	4822 130 42804	BC817-25
7782	4822 130 44568	BC557B
7783	4822 130 60511	BC847B
7784	5322 130 60508	BC857B
7786	4822 130 63494	J111
7787	4822 130 60511	BC847B
7791	4822 130 60511	BC847B
7792	4822 130 60511	BC847B

Note: Only the parts mentioned in this list are normal service spare parts.



3CDC 99 Module

(3 Disc Carrousel Changer)

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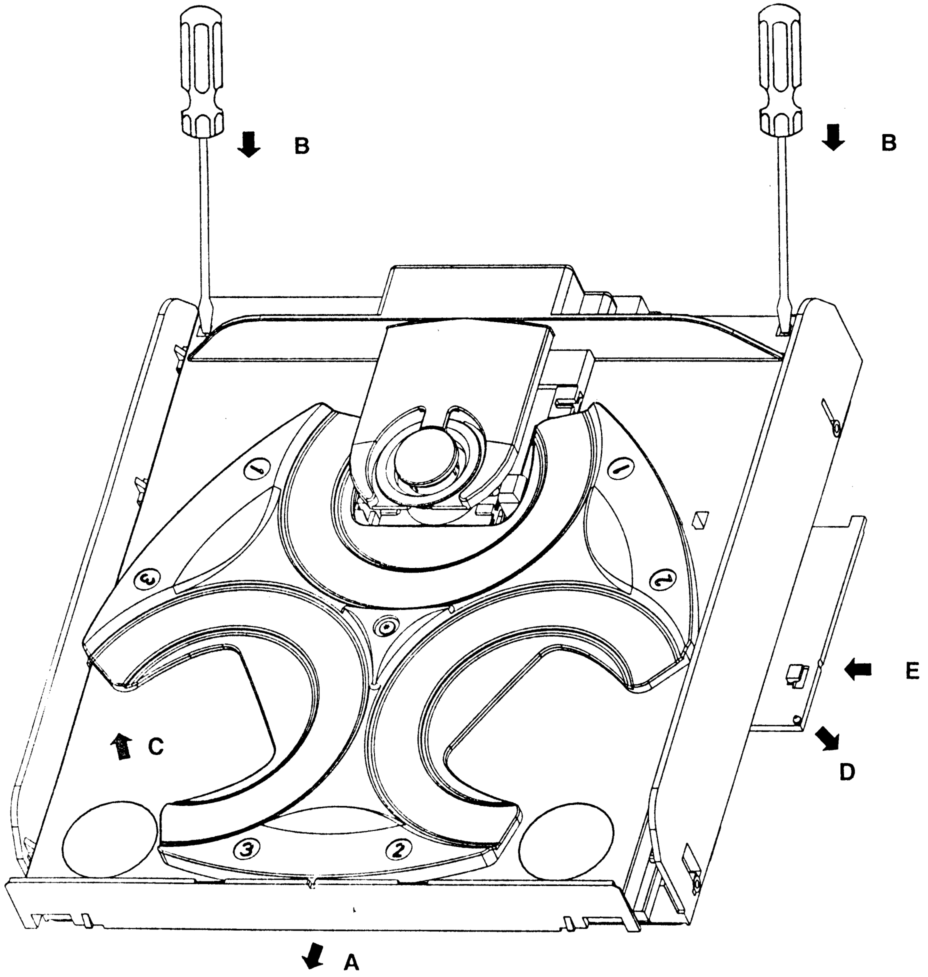
Demounting Hints



Demounting of Drawer

→ A Pull drawer outwards
→ B Unlock drawer with screwdriver
→ C Lift drawer to demount from chassis

Demounting of Flex Plate

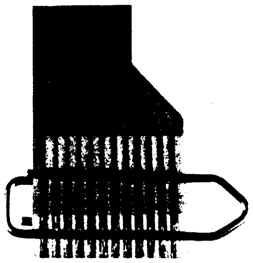
→ D Lift plate to unlock pin from bottom plate
→ E Move plate inwards to demount from bottom plate

Servicing Hints

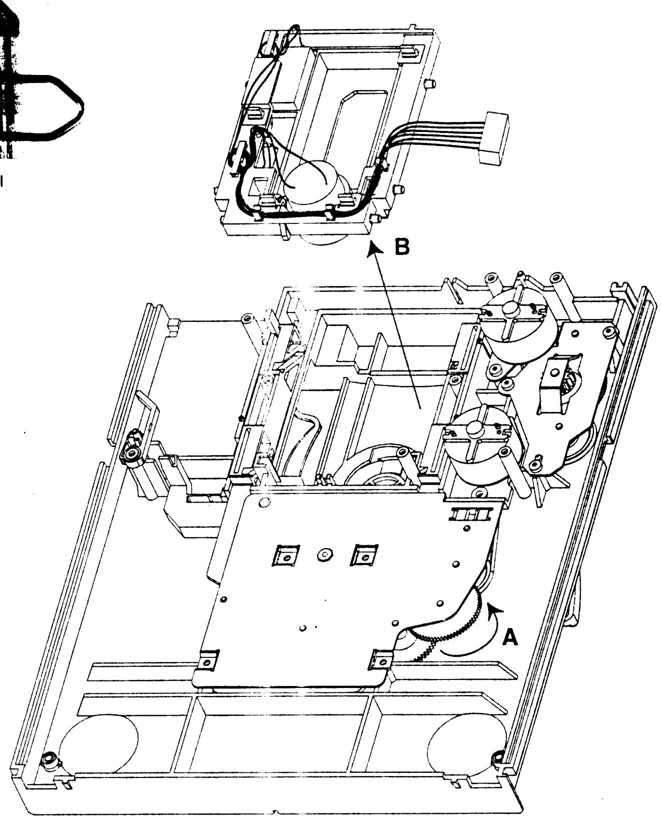
Replacement of CD Drive

See also exploded view of changer mechanism.

1. Demount printed circuit board: remove 5 screws.
2. Disconnect flexfoil and JST connector of CD drive from Printed circuit board. Shortcircuit the flexfoil with a paperclip to protect the laser against ESD.
3. Remove 2 screws (pos 107,108) and demount CD drive lockings (pos 105,106).
4. Turn gearwheel (pos 42) of disc change mechanism by finger to move CD drive support in upper position as shown in picture below Ⓐ.
5. Demount CD drive support (pos 95) Ⓑ.
6. Replace CD drive (pos 100). The wire tree of JST connector has to be desoldered and resoldered on the new CD drive again.



CD drive flex foil

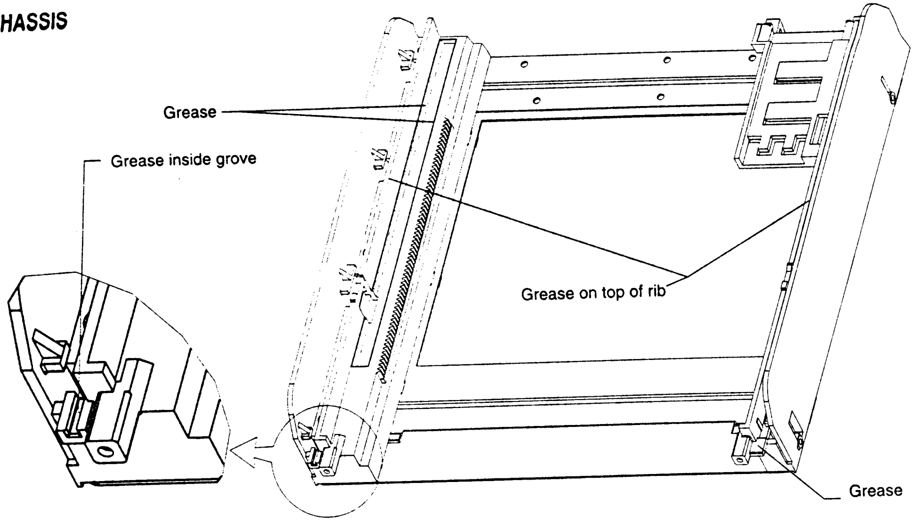


Mounting of Carrousel

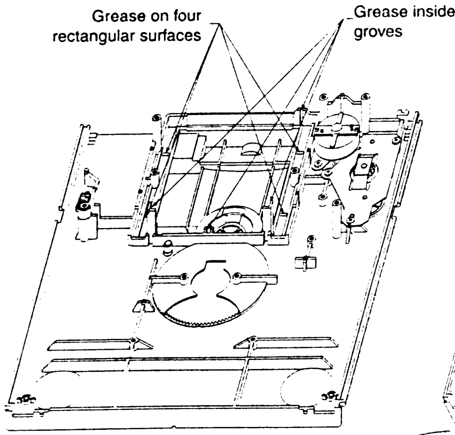
1. Turn gearwheel (pos 42) of disc change mechanism by finger until CD drive is in play position.
2. Mount carrousel (pos 115) so that disc is positioned right on turntable. Carrousel position number doesn´t matter.

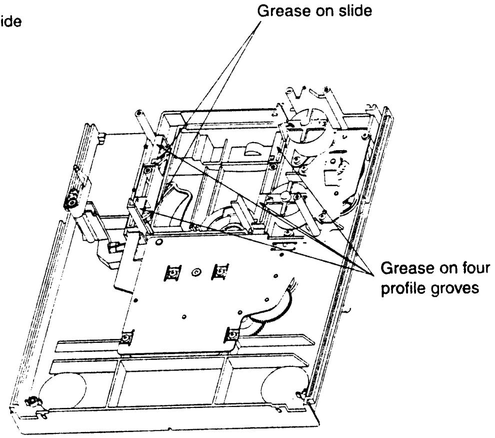
Lubrication Instructions

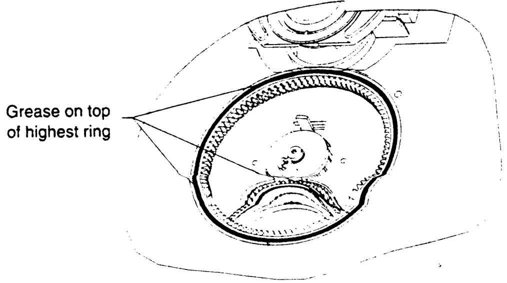
CHASSIS


Grease
Grease inside grove
Grease on top of rib
Grease

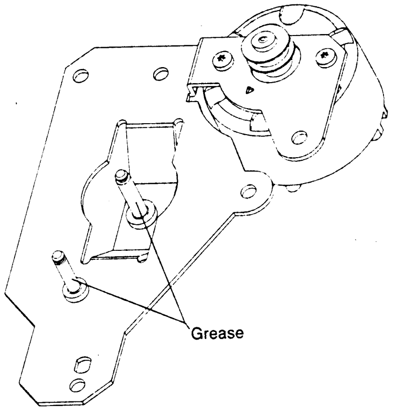
DRAWER


Grease on four rectangular surfaces
Grease inside groves

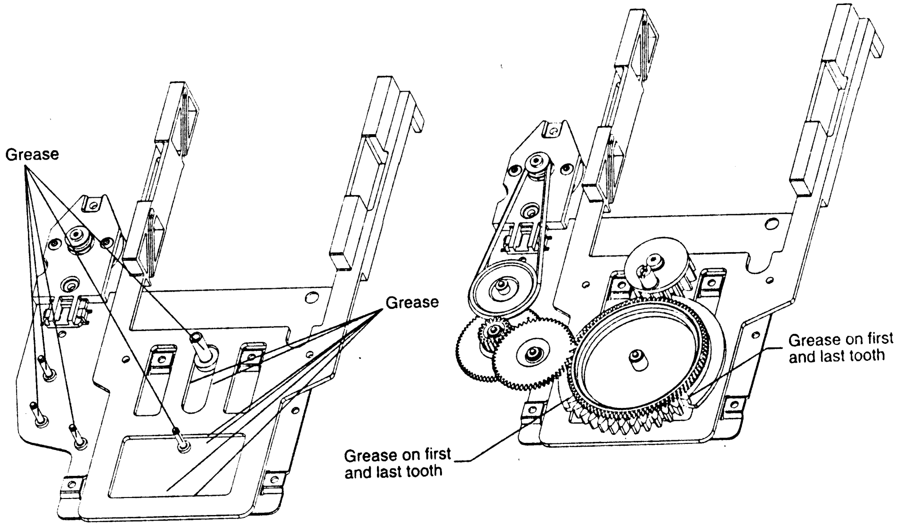

Grease on slide
Grease on four profile groves


Grease on top of highest ring

DRAWER MECHANISM



DISC CHANGE MECHANISM


Grease
Grease
Grease on first and last tooth
Grease on first and last tooth

Use only grease **Polylub GLY 801** service codenumber 4822 390 10136

WARNING

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE

- ***SWITCH OFF POWER SUPPLY***
- ***ESD PROTECTION***

ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the CDM mechanism:

1. Disconnect old CD drive flexfoil from printed board
2. Connect paperclip to CD drive flexfoil to short-circuit flexfoil (fig.1)
3. Short-circuit printed board with **brass-sheet (4822 321 11197)** plugged into the flexfoil connector (fig.2)
4. Remove old CD drive mechanism
5. Position new CD mechanism in its studs
6. Remove short-circuit from printed board connector
7. Remove short-circuit from flexfoil of new CD drive
8. Connect new flexfoil to print connector (fig.3)

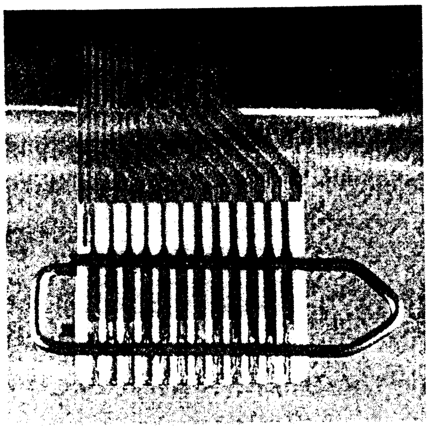


fig.1

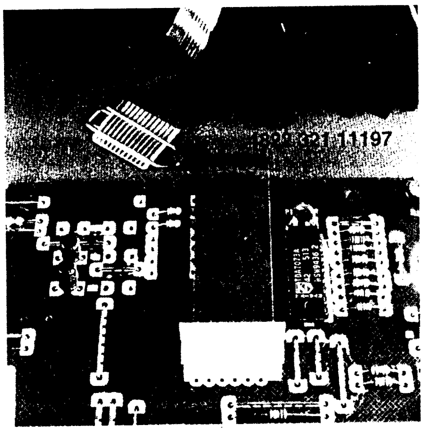


fig.2

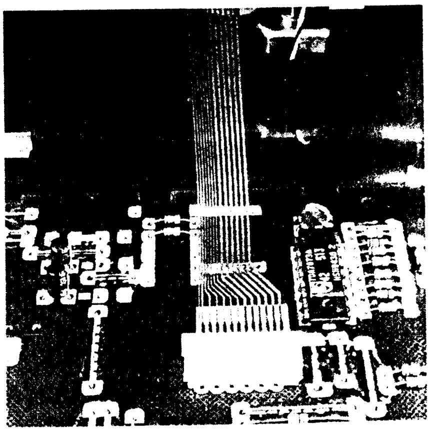
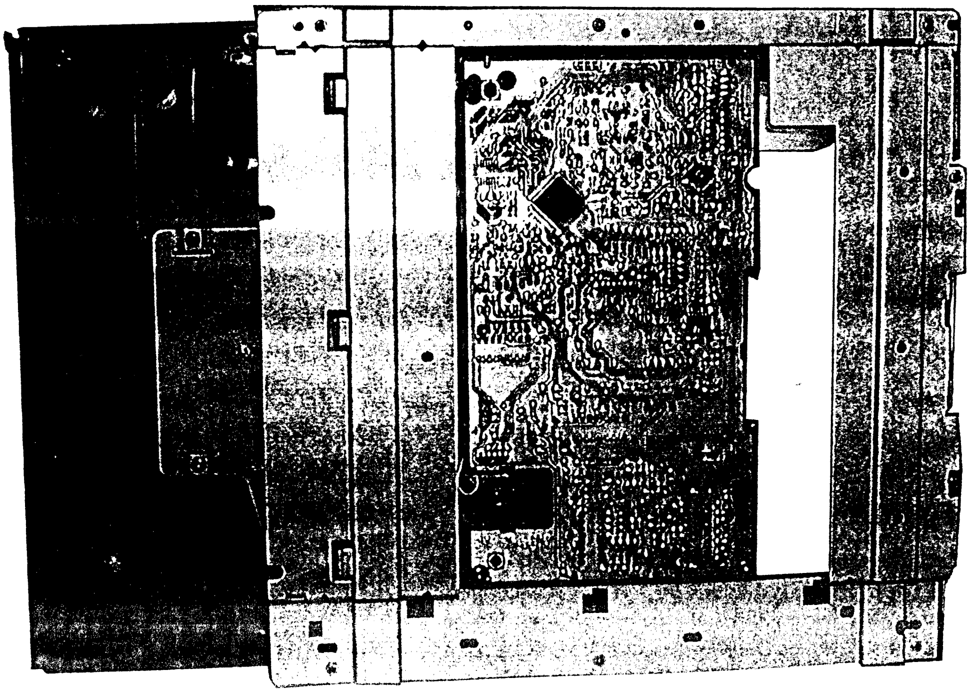
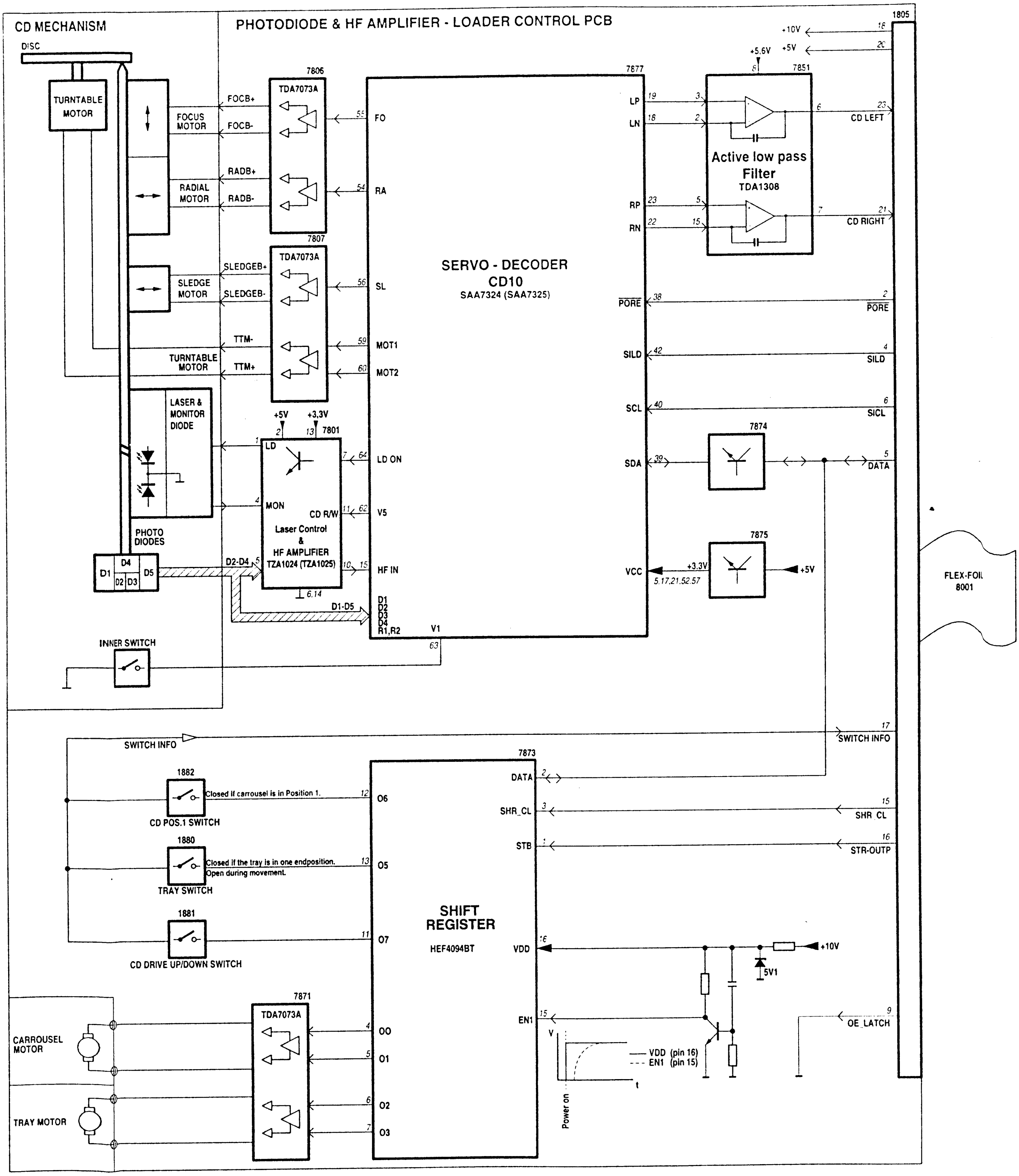


fig.3

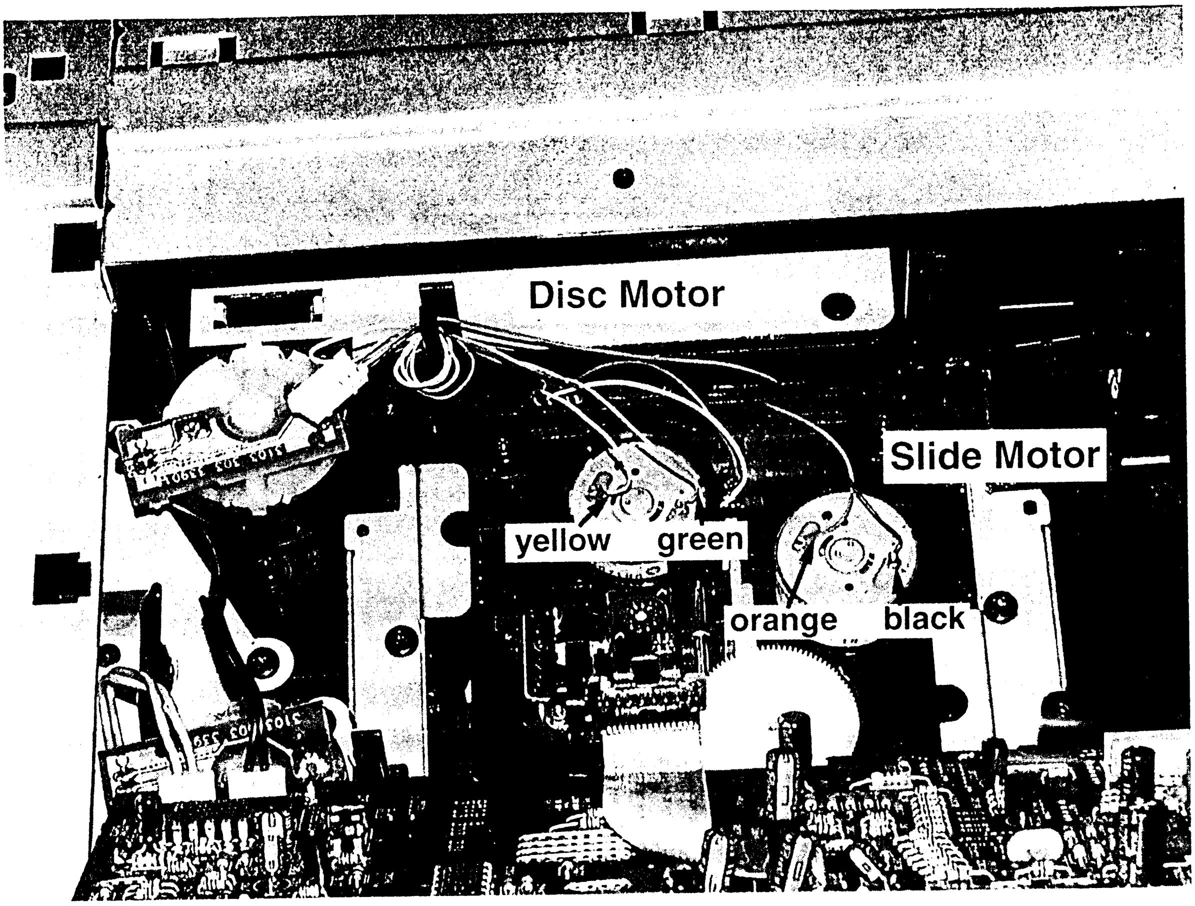
Service Position



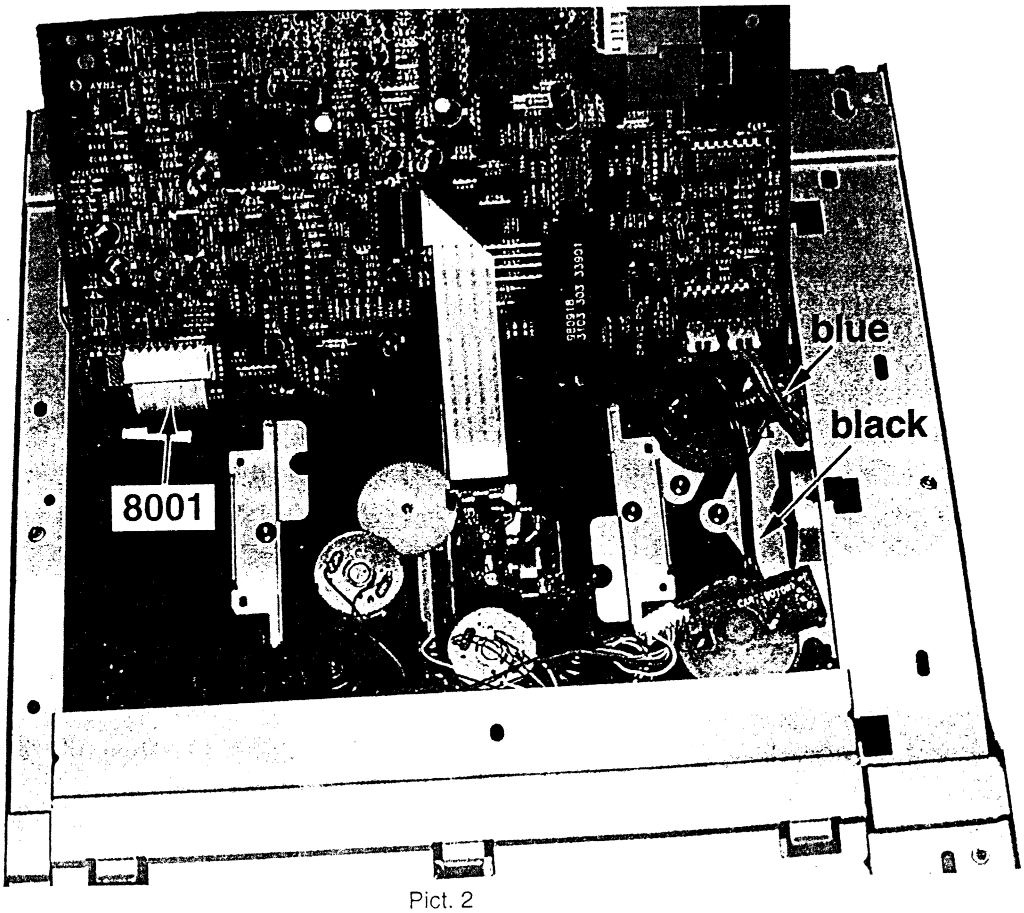
Blockdiagram


CD MECHANISM
DISC
TURNTABLE MOTOR
FOCUS MOTOR
RADIAL MOTOR
SLEDGE MOTOR
TURNTABLE MOTOR
LASER & MONITOR DIODE
PHOTO DIODES
D1
D4
D2
D3
D5
INNER SWITCH
PHOTODIODE & HF AMPLIFIER - LOADER CONTROL PCB
FOCB+
FOCB-
RADB+
RADB-
SLEDGEB+
SLEDGEB-
TTM-
TTM+
7806
TDA7073A
7807
TDA7073A
+5V
+3,3V
7801
LD
MON
CD R/W
Laser Control
&
HF AMPLIFIER
TZA1024 (TZA1025)
D2-D4
D1-D5
6.14
7877
SERVO - DECODER
CD10
SAA7324 (SAA7325)
FO
RA
SL
MOT1
MOT2
LD ON
V5
HF IN
D1
D2
D3
D4
R1,R2
V1
63
LP
LN
RP
RN
PORE
SILD
SCL
SDA
VCC
+3,3V
5.17.21.52.57
7851
+5,6V
Active low pass
Filter
TDA1308
7874
7875
+5V
1805
+10V
+5V
CD LEFT
CD RIGHT
PORE
SILD
SICL
DATA
FLEX-FOIL
8001
SWITCH INFO
SWITCH INFO
1882
Closed if carrousel is in Position 1.
CD POS.1 SWITCH
1880
Closed if the tray is in one endposition.
Open during movement.
TRAY SWITCH
1881
CD DRIVE UP/DOWN SWITCH
7873
SHIFT
REGISTER
HEF4094BT
DATA
SHR_CL
STB
VDD
EN1
O6
O5
O7
O0
O1
O2
O3
SHR CL
STR-OUTP
OE_LATCH
+10V
5V1
V
t
VDD (pin 16)
EN1 (pin 15)
Power on
7871
TDA7073A
CARROUSEL MOTOR
TRAY MOTOR

Wiring of CD Drive

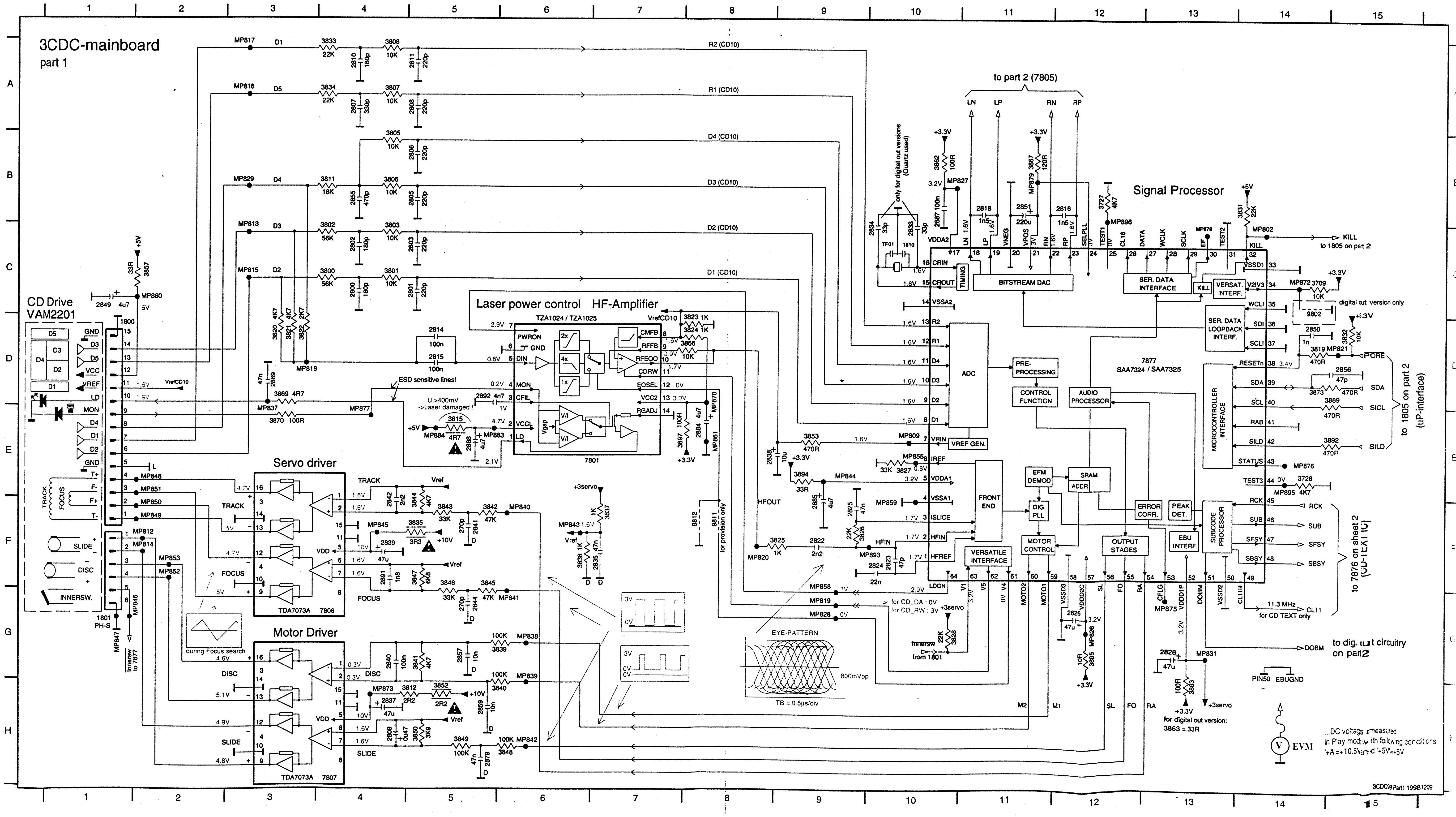

Disc Motor
Slide Motor
yellow
green
orange
black

Pict. 1

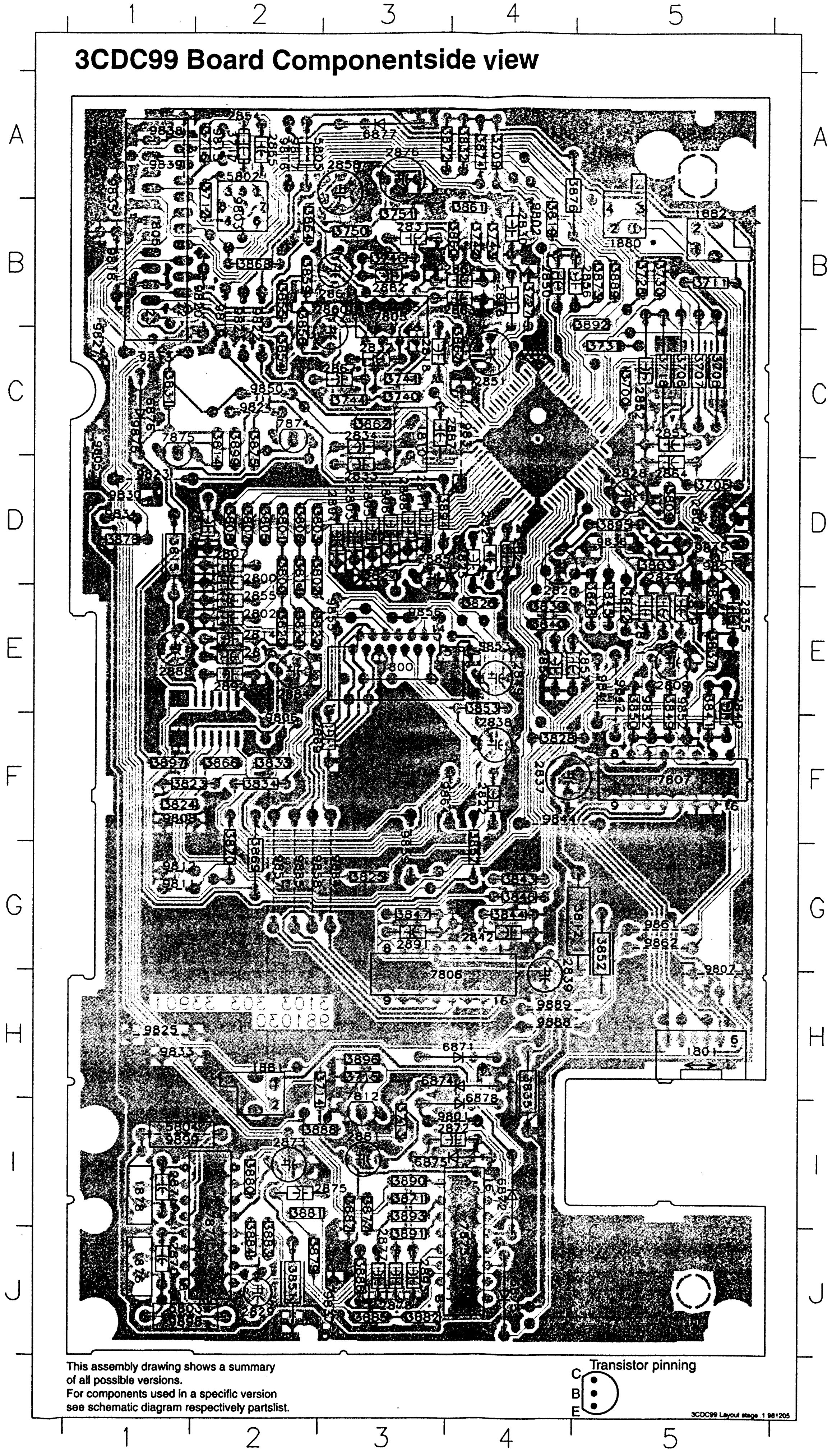

blue
black
8001

Pict. 2

1800 D2
1801 G1
1810 C10
2800 C4
2801 C5
2802 C4
2803 C5
2805 B5
2806 B5
2807 A4
2808 A5
2809 H4
2810 A4
2811 A5
2814 D5
2815 D5
2816 B12
2818 B11
2822 F9
2823 F10
2824 F10
2825 F9
2826 G12
2828 G13
2833 C10
2834 C10
2835 F7
2837 H4
2838 E8
2839 F4
2840 G4
2841 F5
2842 F4
2844 G5
2849 C1
2850 D14
2851 B11
2855 B4
2856 D15
2857 G5
2859 H5
2869 D3
2879 H5
2880 D8
2884 E8
2885 F9
2887 B10
2888 E5
2891 F4
2892 D5
3709 C14
3727 B12
3728 E14
3800 C4
3801 C4
3802 C4
3803 C4
3805 B4
3806 B4
3807 A4
3808 A4
3811 B4
3812 H5
3815 E5
3819 D14
3820 D3
3821 D3
3822 D3
3823 D8
3824 D8
3825 F9
3826 F9
3827 E10
3828 G10
3831 B14
3832 D15
3833 A4
3834 A4
3835 F5
3837 F7
3838 F6
3839 G6
3840 H6
3841 G5
3842 F5
3843 F5
3844 F5
3845 F5
3846 F5
3847 F5
3848 H6
3849 H5
3850 H5
3852 H5
3853 E9
3857 C2
3862 B10
3863 H13
3866 D8
3867 B11
3869 D3
3870 E3
3873 D14
3889 D15
3892 E15
3894 E9
3895 G12
3897 E7
7801 E7
7806 G4
7807 H4
7877 D12
9802 C14
9811 F8
9812 F8


3CDC-mainboard
part 1
CD Drive
VAM2201
Laser power control HF-Amplifier
TZA1024 / TZA1025
7801
Servo driver
TDA7073A 7806
Motor Driver
TDA7073A 7807
Signal Processor
7877
SAA7324 / SAA7325
to part 2 (7805)
LN LP RN RP
BITSTREAM DAC
SER. DATA INTERFACE
KILL
VERSAT. INTERF.
SER. DATA LOOPBACK INTERF.
MICROCONTROLLER INTERFACE
ADC
PRE-PROCESSING
CONTROL FUNCTION
AUDIO PROCESSOR
FRONT END
EFM DEMOD
DIG. PLL
SRAM
ADDR
MOTOR CONTROL
VERSATILE INTERFACE
ERROR CORR.
PEAK DET.
OUTPUT STAGES
EBU INTERF.
SUBCODE PROCESSOR
VREF GEN.
TIMING
R2 (CD10)
R1 (CD10)
D4 (CD10)
D3 (CD10)
D2 (CD10)
D1 (CD10)
KILL
to 1805 on part 2
to 1805 on part 2 (uP-interface)
PORE
SDA
SICL
SILD
RCK
SUB
SFSY
SBSY
to 7876 on sheet 2 (CD-TEXT IC)
11.3 MHz
for CD TEXT only
CL11
DOBM
to dig. out circuitry on part 2
digital out version only
only for digital out versions (Quartz used)
for provision only
ESD sensitive lines!
U >400mV
->Laser damaged !
TRACK
FOCUS
DISC
SLIDE
INNERSW.
1801 PH-S
innersw to 7877
during Focus search
EYE-PATTERN
800mVpp
TB = 0.5µs/div
for CD_DA : 0V
for CD_RW : 3V
innersw from 1801
for digital out version:
3863 = 33R
PIN50 EBUGND
EVM
...DC voltages measured in Play mode with following conditions '+A'=+10.5V and '+5V'=+5V
3CDC99 Part1 19981209

3CDC99 Board Componentside view

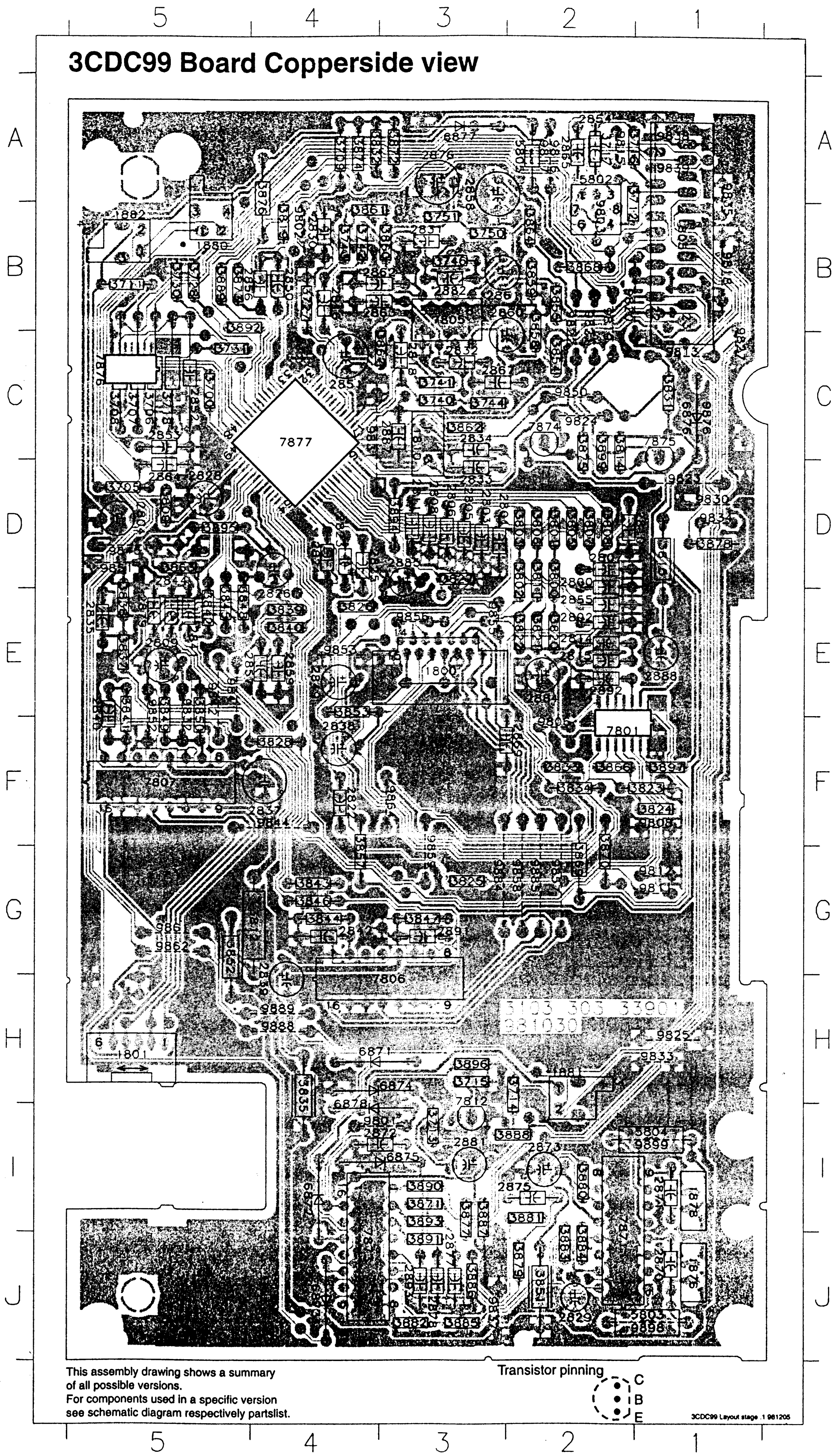


This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

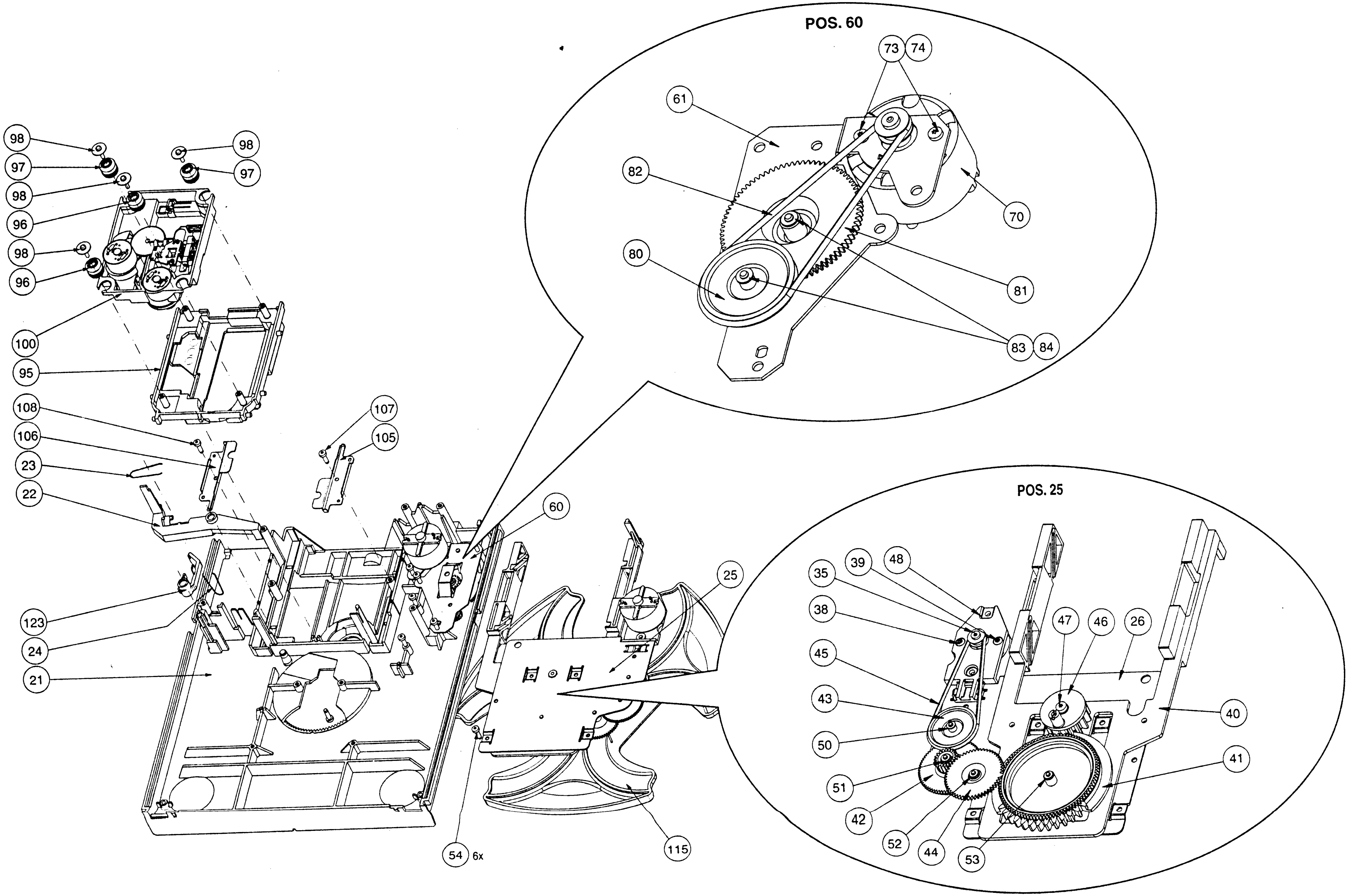
Mapping

1800	E3
1801	H5
1805	B1
1810	C3
1876	J1
1878	I1
1880	B5
1881	H2
1882	B5
2800	D2
2801	D3
2802	E2
2803	D3
2804	D5
2805	D3
2806	D3
2807	D2
2808	D3
2809	E5
2810	D2
2811	D3
2814	E2
2815	E2
2816	B4
2818	C3
2822	F4
2823	D4
2824	D4
2825	D4
2826	E4
2828	D5
2829	J2
2830	B4
2831	B3
2832	C3
2833	D3
2834	C3
2835	E5
2837	F4
2838	F4
2839	H4
2840	E5
2841	E5
2842	G4
2844	D5
2849	E4
2850	B4
2851	C4
2852	C5
2853	C5
2854	A2
2855	E2
2856	B5
2857	E5
2858	A3
2859	E4
2860	B3
2861	B3
2862	B4
2863	B4
2864	D5
2865	A2
2867	C3
2869	F2
2870	J1
2871	I1
2872	I4
2873	I2
2875	I3
2876	A3
2877	J3
2878	J3
2879	E5
2881	I3
2882	B3
2884	E2
2885	D3
2887	C4
2888	E1
2891	G3
2892	E2
2893	J3
3700	C5
3705	D5
3706	C5
3707	C5
3708	C5
3709	A4
3711	B5
3712	B2
3713	I3
3714	H3
3715	H3
3716	A2
3717	A2
3718	C5
3727	B4
3728	B5
3730	B5
3731	C5
3740	C3
3741	C3
3742	B4
3743	B4
3744	C3
3746	B3
3750	B3
3751	B3
3800	D2
3801	D2
3802	D2
3803	D2
3805	D2
3806	D2
3807	D2
3808	D2
3809	D5
3811	D2
3812	G5
3814	C2
3815	D1
3819	B4
3820	E2
3821	E2
3822	E2
3823	F1
3824	F1
3825	G3
3826	E4
3827	D3
3828	F4
3831	C1
3832	A4
3833	F2
3834	F2
3835	H4
3837	E5
3838	E5
3839	E4
3840	E4
3841	E5
3842	E5
3843	G4
3844	G4
3845	E5
3846	G4
3847	G3
3848	E5
3849	E5
3850	E5
3851	J2
3852	G5
3853	E4
3854	C2
3855	B2
3857	G4
3858	C2
3859	B2
3860	B4
3861	B4
3862	C3
3863	D5
3864	B2
3866	F2
3867	C4
3868	B2
3869	G2
3870	G2
3871	I3
3872	A3
3873	B5
3874	A4
3875	C2
3876	A4
3877	I3
3878	D1
3879	J2
3880	I2
3881	I2
3882	J3
3883	J2
3884	J2
3885	J3
3886	J3
3887	I3
3888	I3
3889	B5
3890	I3
3891	J3
3892	B5
3893	I3
3894	D3
3895	D5
3896	H3
3897	F1
3899	C2
5802	A2
5803	J1
5804	I1
5805	A2
6871	H4
6872	I4
6873	J4
6874	H3
6875	I3
6876	C1
6877	A3
6878	H4
7801	F1
7805	B3
7806	H3
7807	F5
7812	H3
7871	J2
7873	J4
7874	C2
7875	C1
7876	C5
7877	C4
9801	I4
9802	B4
9803	B2
9805	D1
9806	F2
9807	G5
9808	F1
9811	G1
9812	G1
9813	C1
9815	A2
9816	A2
9817	A2
9818	B1
9819	B2
9820	B2
9821	B2
9822	B2
9823	D1
9824	C2
9825	H1
9827	C1
9830	D1
9831	C4
9832	E5
9833	H1
9834	D1
9835	A1
9836	D5
9837	J3
9838	A1
9839	A1
9841	E5
9842	E5
9844	F4
9845	D5
9850	C2
9851	D5
9852	E5
9853	E4
9855	E3
9856	E3
9857	G2
9858	G2
9859	G3
9861	G5
9862	G5
9864	F3
9876	C1
9884	G3
9885	G2
9888	H4
9889	H4
9898	J1
9899	I1

3CDC99 Board Copperside view



This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.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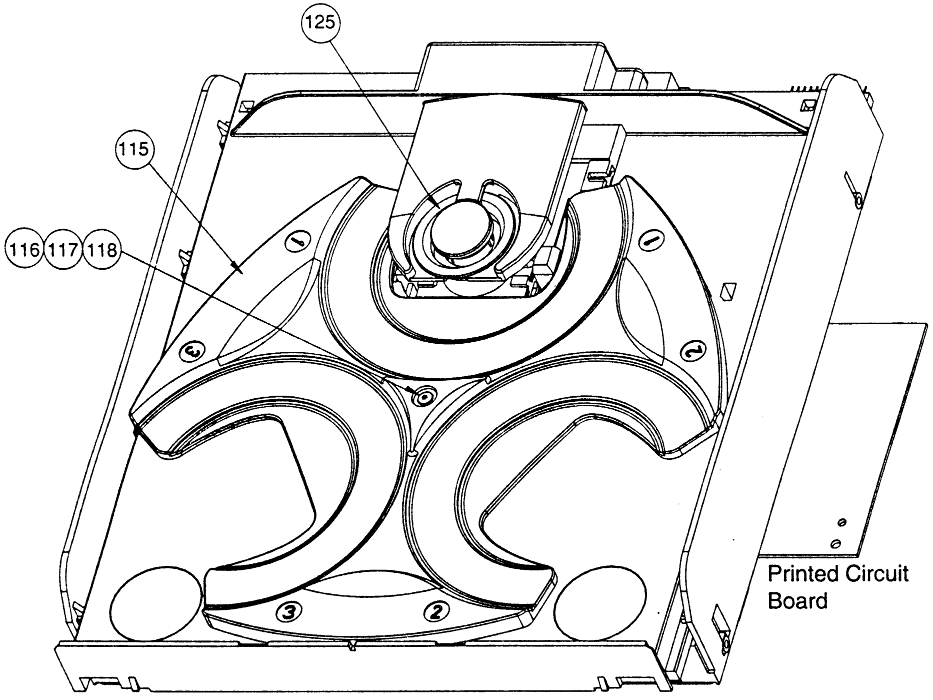
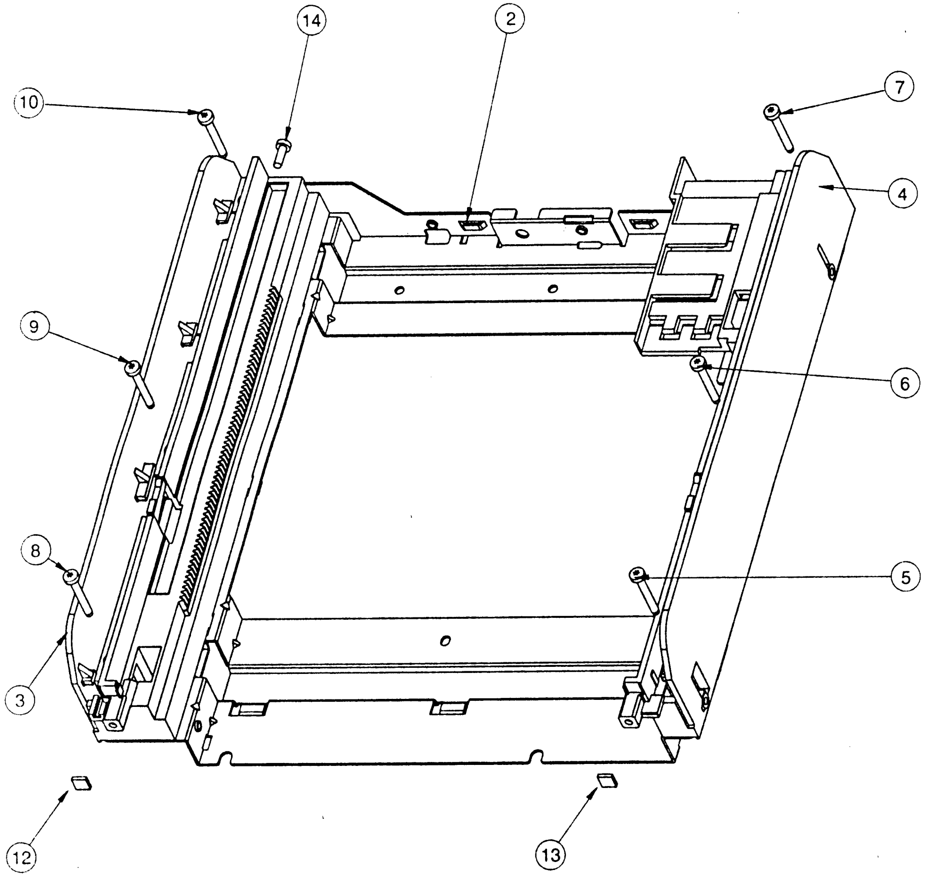
54 6x
POS. 25



MECHANICAL PARTSLIST 3CDC-99 MODULE

	4822 390 10136	POLYLUB GLY801 (GREASE)	43	4822 528 10937	PULLEY
3	4822 463 11008	GUIDE LEFT	44	4822 522 10493	IDLER WHEEL
4	4822 463 11009	GUIDE RIGHT	45	4822 358 10115	BELT
21	4822 441 11615	DRAWER	46	4822 466 10735	ECCENTRIC GEAR WHEEL
22	4822 402 10088	BRACKET TUMBLER	50	4822 532 12364	WASHER
38	4822 502 12548	SCREW M2.6X3.5	51	4822 532 12364	WASHER
39	4822 502 12548	SCREW M2.6X3.5	52	4822 532 12364	WASHER
40	4822 463 11011	SLIDE	53	4822 532 12364	WASHER
41	4822 522 10509	CONTROL DISC	35	4822 361 10753	CARROUSEL MOTOR
42	4822 522 10492	GEAR WHEEL	70	4822 361 10753	CARROUSEL MOTOR

continued on next page



MECHANICAL PARTSLIST 3CDC-99 MODULE

73	4822 502 12548	SCREW M2.6X3.5
74	*4822 502 12548*	*SCREW M2.6X3.5*
80	4822 528 10937	PULLEY
81	4822 522 10494	GEAR DRAWER
82	4822 358 10115	BELT
83	4822 532 12364	WASHER
84	4822 532 12364	WASHER
95	4822 404 10895	SUPPORT
96	4822 529 10431	SUSPENSION
97	4822 529 10431	SUSPENSION
100	4822 691 10772	CD DRIVE VAM2201
115	4822 466 10736	CARROUSEL
117	4822 532 12365	BUSH DRAWER
123	4822 402 11237	SWITCH BRACKET
125	4822 401 11708	DISC CLAMP

ELECTRICAL PARTSLIST 3CDC-99 MODULE

MISCELLANEOUS

1800	4822 265 10925	FLEX FOIL CONNECTOR 15PIN
1805	4822 265 11533	FLEX FOIL CONNECTOR 23PIN
1805	4822 267 51322	FLEX FOIL CONNECTOR 15 PIN
1880	4822 276 13503	SWITCH
1881	4822 276 13503	SWITCH
1882	4822 276 13503	SWITCH

CAPACITORS

2800	4822 126 10053	180pF	10%	50V
2801	4822 122 10466	220pF	10%	50V
2802	4822 126 10053	180pF	10%	50V
2803	4822 122 10466	220pF	10%	50V
2804	4822 124 40246	4,7µF	20%	63V
2805	4822 122 10466	220pF	10%	50V
2806	4822 122 10466	220pF	10%	50V
2807	4822 126 12787	330pF	10%	50V
2808	4822 122 10466	220pF	10%	50V
2809	5322 124 41948	0,47µF	20%	50V
2810	4822 126 10053	180pF	10%	50V
2811	4822 122 10466	220pF	10%	50V
2814	4822 126 12785	47nF	20%	50V
2815	4822 126 12882	100nF	20%	50V
2816	4822 126 12878	1,5nF	10%	16V
2818	4822 126 12878	1,5nF	10%	16V
2822	4822 126 12339	2,2nF	10%	16V
2823	4822 122 33848	47pF	5%	50V
2824	4822 126 11585	22nF	20%	50V
2825	4822 126 12785	47nF	20%	50V
2826	4822 124 80231	47µF	20%	16V
2828	4822 124 40433	47µF	20%	25V
2829	4822 124 21732	10µF	20%	25V
2830	4822 126 12785	47nF	20%	50V
2831	4822 122 33195	100pF	10%	50V
2832	4822 122 33195	100pF	10%	50V
2833	4822 122 33069	33pF	5%	50V
2834	4822 122 33069	33pF	5%	50V
2835	4822 126 12785	47nF	20%	50V
2837	4822 124 40433	47µF	20%	25V
2838	4822 124 41579	10µF	20%	50V
2839	4822 124 40433	47µF	20%	25V
2840	4822 126 12882	100nF	20%	50V
2841	4822 126 12702	270pF	10%	50V
2842	4822 126 12339	2,2nF	10%	16V
2844	4822 126 12702	270pF	10%	50V
2849	4822 124 40246	4,7µF	20%	63V
2850	4822 122 33197	1nF	10%	50V
2851	4822 124 40196	220µF	20%	16V
2852	4822 126 12785	47nF	20%	50V
2853	4822 126 11585	22nF	20%	50V
2854	4822 126 12785	47nF	20%	50V
2855	4822 122 33519	470pF	10%	50V
2856	4822 122 33848	47pF	5%	50V
2857	4822 121 51387	10nF	20%	16V
2858	4822 124 40196	220µF	20%	16V
2859	4822 121 51387	10nF	20%	16V
2860	4822 124 41579	10µF	20%	50V
2861	4822 124 41579	10µF	20%	50V
2862	4822 122 10466	220pF	10%	50V
2863	4822 122 10466	220pF	10%	50V
2864	4822 122 33191	22pF	5%	50V
2865	4822 126 11585	22nF	20%	50V
2867	4822 122 10466	220pF	10%	50V
2869	4822 126 12785	47nF	20%	50V

CAPACITORS

2872	4822 126 12785	47nF	20%	50V
2873	4822 124 12233	47µF	20%	25V
2875	4822 126 11585	22nF	20%	50V
2876	4822 124 40196	220µF	20%	16V
2877	4822 122 10319	82pF	5%	50V
2878	4822 122 10466	220pF	10%	50V
2879	4822 126 12785	47nF	20%	50V
2882	4822 122 10466	220pF	10%	50V
2884	4822 124 40246	4,7µF	20%	63V
2885	4822 124 40246	4,7µF	20%	63V
2887	4822 126 12882	100nF	20%	50V
2888	4822 124 40246	4,7µF	20%	63V
2891	4822 122 10576	1,8nF	10%	16V
2892	4822 126 11714	4,7nF	20%	16V
2893	4822 122 10466	220pF	10%	50V

RESISTORS

3700	4822 116 83883	470Ω	5%	0,16W
3705	4822 116 83872	220Ω	5%	0,5W
3706	4822 116 83883	470Ω	5%	0,16W
3707	4822 116 83883	470Ω	5%	0,16W
3708	4822 116 83883	470Ω	5%	0,16W
3709	4822 116 83864	10kΩ	5%	0,5W
3711	4822 116 83864	10kΩ	5%	0,5W
3712	4822 116 52176	10Ω	5%	0,5W
3713	4822 116 52257	22kΩ	5%	0,5W
3714	4822 116 83864	10kΩ	5%	0,5W
3715	4822 116 52234	100kΩ	5%	0,5W
3716	4822 116 83883	470Ω	5%	0,16W
3718	4822 116 52283	4,7kΩ	5%	0,5W
3727	4822 116 52283	4,7kΩ	5%	0,5W
3728	4822 116 52283	4,7kΩ	5%	0,5W
3730	4822 116 52271	33kΩ	5%	0,16W
3731	4822 116 83864	10kΩ	5%	0,5W
3740	4822 116 52257	22kΩ	5%	0,5W
3741	4822 116 52257	22kΩ	5%	0,5W
3742	4822 116 52257	22kΩ	5%	0,5W
3743	4822 116 52257	22kΩ	5%	0,5W
3744	4822 116 83864	10kΩ	5%	0,5W
3746	4822 116 83864	10kΩ	5%	0,5W
3750	4822 050 11002	1kΩ	5%	0,2W
3751	4822 050 11002	1kΩ	5%	0,2W
3800	4822 116 52291	56kΩ	5%	0,5W
3801	4822 116 83864	10kΩ	5%	0,5W
3802	4822 116 52291	56kΩ	5%	0,5W
3803	4822 116 83864	10kΩ	5%	0,5W
3805	4822 116 83864	10kΩ	5%	0,5W
3806	4822 116 83864	10kΩ	5%	0,5W
3807	4822 116 83864	10kΩ	5%	0,5W
3808	4822 116 83864	10kΩ	5%	0,5W
3809	4822 116 83876	270Ω	5%	0.16W
3811	4822 116 52251	18kΩ	5%	0,5W
3812	4822 053 10228	2,2Ω	5%	1W
3814	4822 116 52191	33Ω	5%	0,5W
3815	4822 052 10478	4,7Ω	5%	NFR
3819	4822 116 83883	470Ω	5%	0,16W
3820	4822 116 52283	4,7kΩ	5%	0,5W
3821	4822 116 52283	4,7kΩ	5%	0,5W
3822	4822 116 52249	1,8kΩ	5%	0,16W
3823	4822 050 11002	1kΩ	5%	0,2W
3824	4822 050 11002	1kΩ	5%	0,2W
3825	4822 050 11002	1kΩ	5%	0,2W
3826	4822 116 52257	22kΩ	5%	0,5W
3827	4822 116 52271	33kΩ	5%	0,16W

ELECTRICAL PARTSLIST 3CDC-99 MODULE

RESISTORS

3828	4822 116 52257	22kΩ	5%	0.5W
3831	4822 116 52257	22kΩ	5%	0,5W
3832	4822 116 83864	10kΩ	5%	0,5W
3833	4822 116 52257	22kΩ	5%	0.5W
3834	4822 116 52257	22kΩ	5%	0,5W
3835	4822 052 10338	3,3Ω		NFR25
3837	4822 050 11002	1kΩ	5%	0,2W
3838	4822 050 11002	1kΩ	5%	0,2W
3839	4822 116 52234	100kΩ	5%	0,5W
3840	4822 116 52234	100kΩ	5%	0,5W
3841	4822 116 52283	4,7kΩ	5%	0,5W
3842	4822 116 83884	47kΩ	5%	0,16W
3843	4822 116 52271	33kΩ	5%	0,16W
3844	4822 116 52283	4,7kΩ	5%	0,5W
3845	4822 116 83884	47kΩ	5%	0,16W
3846	4822 116 52271	33kΩ	5%	0,16W
3847	4822 116 83961	6,8kΩ	5%	0,16W
3848	4822 116 52234	100kΩ	5%	0,5W
3849	4822 116 52234	100kΩ	5%	0,5W
3850	4822 116 52276	3,9kΩ	5%	0,5W
3851	4822 052 10338	3,3Ω		NFR25
3852	4822 052 10228	2,2Ω	5%	0,33W
3853	4822 116 83883	470Ω	5%	0,16W
3854	4822 116 52175	100Ω	5%	0,5W
3855	4822 116 52175	100Ω	5%	0,5W
3857	4822 116 52191	33Ω	5%	0,5W
3858	4822 116 52257	22kΩ	5%	0,5W
3859	4822 116 52257	22kΩ	5%	0,5W
3860	4822 116 83864	10kΩ	5%	0,5W
3861	4822 116 83864	10kΩ	5%	0,5W
3862	4822 116 52175	100Ω	5%	0,5W
3863	4822 116 52175	100Ω	5%	0,5W
3863	4822 116 52191	33Ω	5%	0,5W
3864	4822 116 52175	100Ω	5%	0,5W
3866	4822 116 83864	10kΩ	5%	0,5W
3867	4822 116 83868	150Ω	5%	0,5W
3869	4822 050 24708	4,7Ω	1%	0,6W
3870	4822 116 52175	100Ω	5%	0,5W
3871	4822 116 83864	10kΩ	5%	0,5W
3872	4822 116 83864	10kΩ	5%	0,5W
3873	4822 116 83883	470Ω	5%	0,16W
3874	4822 116 83864	10kΩ	5%	0,5W
3875	4822 116 83864	10kΩ	5%	0,5W
3876	4822 116 83864	10kΩ	5%	0,5W
3877	4822 116 83864	10kΩ	5%	0,5W
3878	4822 116 83864	10kΩ	5%	0,5W
3879	4822 116 83864	10kΩ	5%	0,5W
3880	4822 116 52219	330Ω	5%	0,5W
3881	4822 116 83864	10kΩ	5%	0,5W
3882	4822 116 83884	47kΩ	5%	0,16W
3883	4822 116 52234	100kΩ	5%	0,5W
3884	4822 116 52276	3,9kΩ	5%	0,5W
3885	4822 116 52234	100kΩ	5%	0,5W
3886	4822 116 83884	47kΩ	5%	0,16W
3887	4822 116 83883	470Ω	5%	0,16W
3888	4822 116 83864	10kΩ	5%	0,5W
3889	4822 116 83883	470Ω	5%	0,16W
3890	4822 050 11002	1kΩ	5%	0,2W
3891	4822 050 11002	1kΩ	5%	0,2W
3892	4822 116 83883	470Ω	5%	0,16W
3893	4822 116 83883	470Ω	5%	0,16W
3894	4822 116 52191	33Ω	5%	0,5W
3895	4822 116 52176	10Ω	5%	0,5W
3897	4822 116 52175	100Ω	5%	0,5W
3899	4822 116 52175	100Ω	5%	0,5W

COILS

1810	4822 242 10849	QUARTZ 8,46MHz
1810	4822 242 73557	CERAMIC RES. 8,46MHz
5802	4822 156 31058	FILTER DIGITAL OUT

DIODES

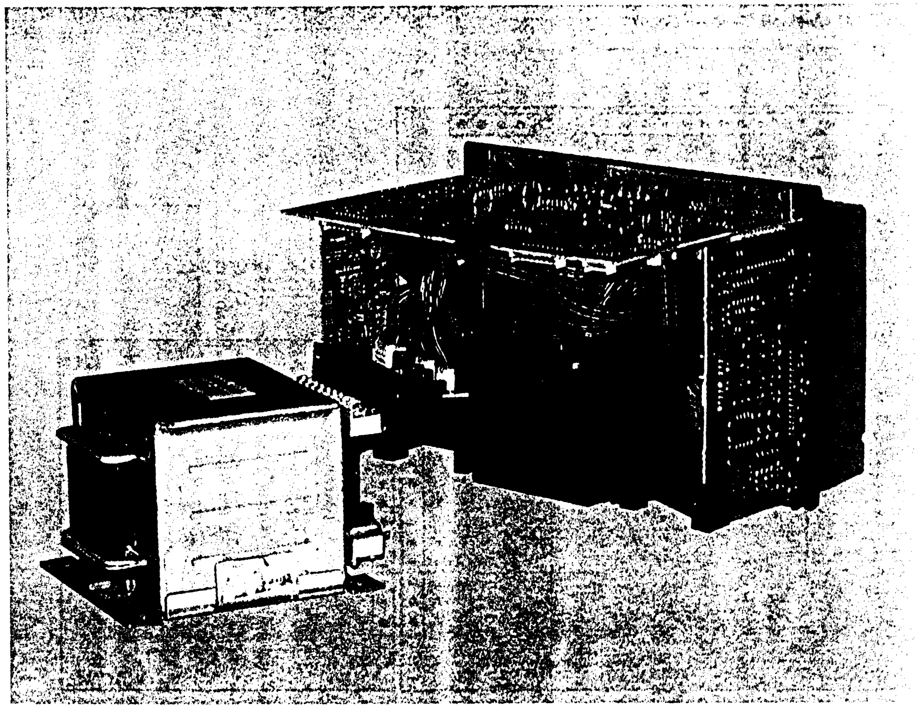
6871	4822 130 30621	1N4148
6872	4822 130 30621	1N4148
6873	4822 130 30621	1N4148
6874	4822 130 30621	1N4148
6875	4822 130 34233	BZX79-B5V1
6877	4822 130 31981	BZX79-C3V9

TRANSISTORS

7812	4822 130 40959	BC547B
7874	4822 130 40959	BC547B
7875	4822 130 40959	BC547B

INTEGRATED CIRCUITS

7801 ©	4822 209 17286	TZA1024T/N1 HF-AMPLIFIER
7805	4822 209 17284	TDA1308 OPAMP
7806	4822 209 32852	TDA7073A/N2 SERVO DRIVER
7807	4822 209 32852	TDA7073A/N2 MOTOR DRIVER
7871	4822 209 32852	TDA7073A/N2 MOTOR DRIVER
7873	5322 209 10421	HEF4094BP SHIFT REGISTER
7876 ©	4822 209 16143	LC89170M CD TEXT
7877 ©	4822 209 17285	SAA7324H/M1 SIGNAL PROCESSOR



POWER 5-VA Module

(70 / 100W Version)

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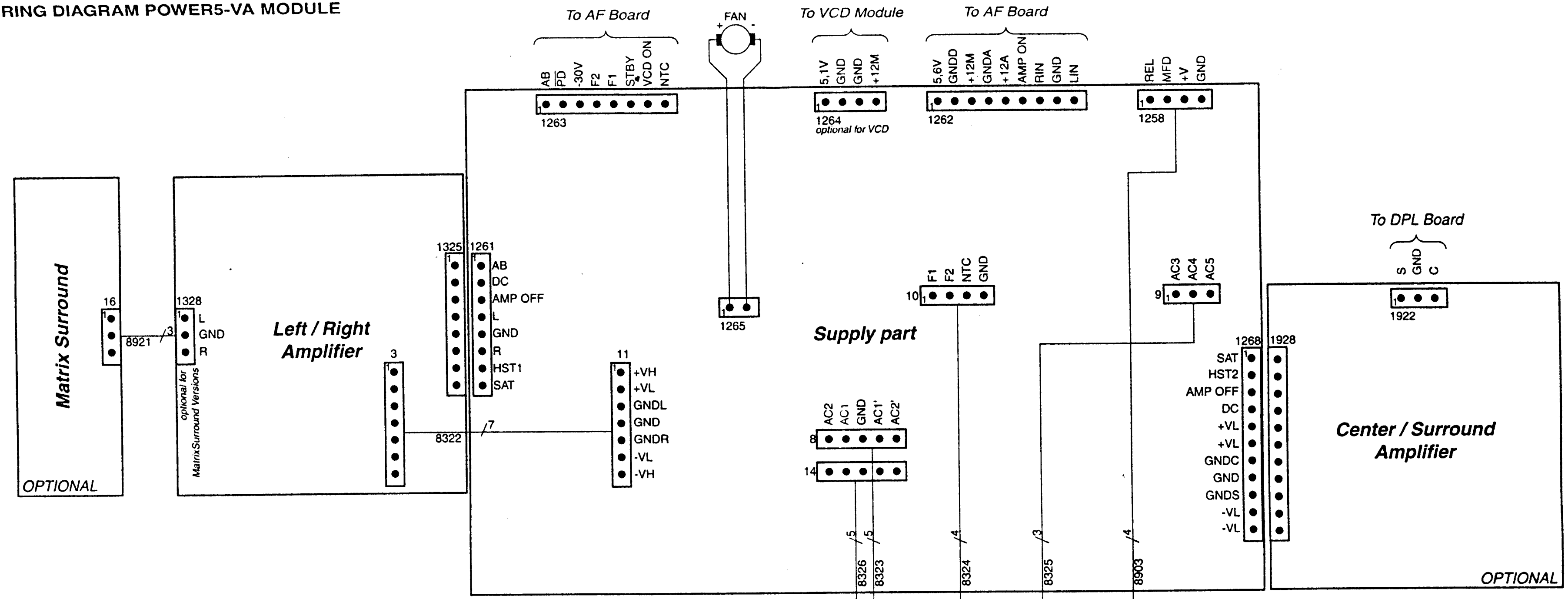
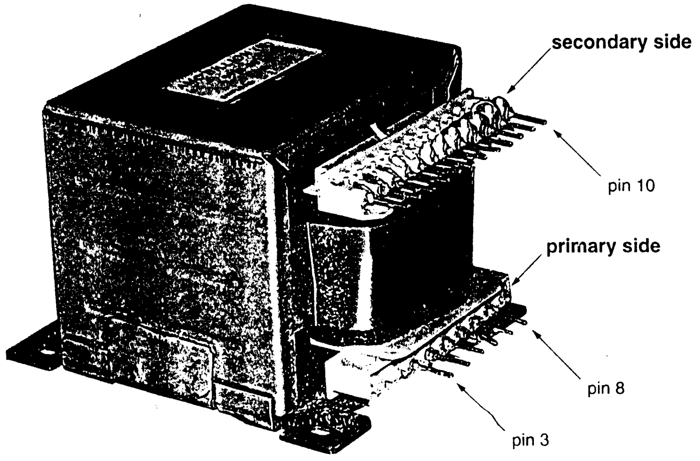
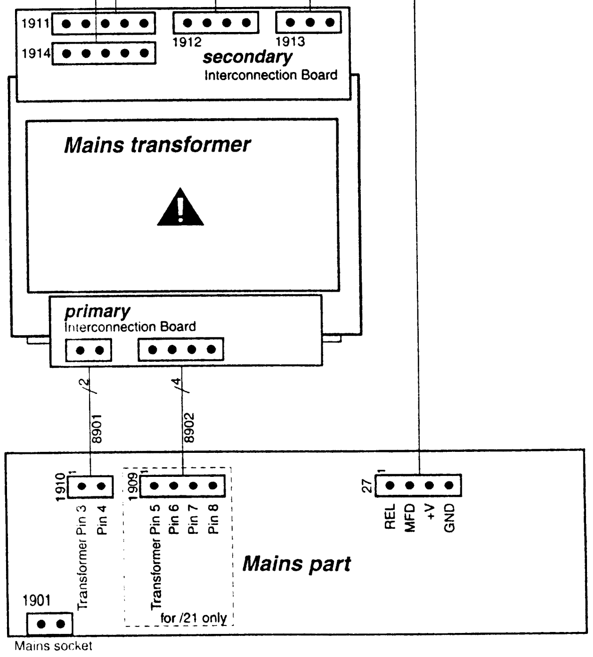
WIRING DIAGRAM POWER5-VA MODULE


To AF Board
AB
PD
-30V
F2
F1
STBY
VCD ON
NTC
1263
FAN
+
-
To VCD Module
5,1V
GND
GND
+12M
1264
optional for VCD
To AF Board
5,6V
GNDD
+12M
GNDA
+12A
AMP ON
RIN
GND
LIN
1262
REL
MFD
+V
GND
1258
To DPL Board
S
GND
C
1922
Matrix Surround
OPTIONAL
16
8921
/3
1328
L
GND
R
optional for MatrixSurround Versions
Left / Right Amplifier
3
8322
/7
1325
1261
AB
DC
AMP OFF
L
GND
R
HST1
SAT
11
+VH
+VL
GNDL
GND
GNDR
-VL
-VH
1265
Supply part
10
F1
F2
NTC
GND
9
AC3
AC4
AC5
8
AC2
AC1
GND
AC1'
AC2'
14
/5
/5
8326
8323
/4
8324
/3
8325
/4
8903
1268
1928
SAT
HST2
AMP OFF
DC
+VL
+VL
GNDC
GND
GNDS
-VL
-VL
Center / Surround Amplifier
OPTIONAL
1

Mains Transformer /21

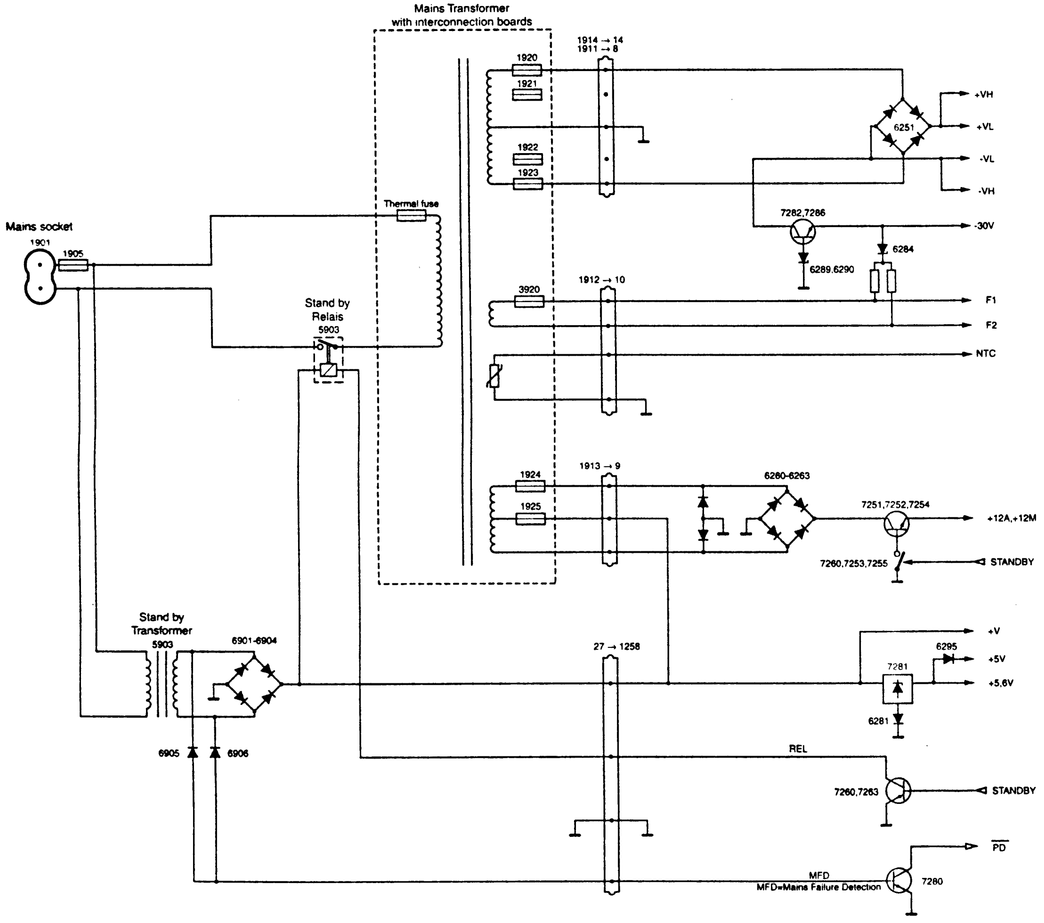

secondary side
pin 10
primary side
pin 8
pin 3


1911
1914
1912
1913
secondary
Interconnection Board
Mains transformer
primary
Interconnection Board
/2
8901
/4
8902
1910
Transformer Pin 3
Pin 4
1909
Transformer Pin 5
Pin 6
Pin 7
Pin 8
for /21 only
27
REL
MFD
+V
GND
Mains part
1901
Mains socket

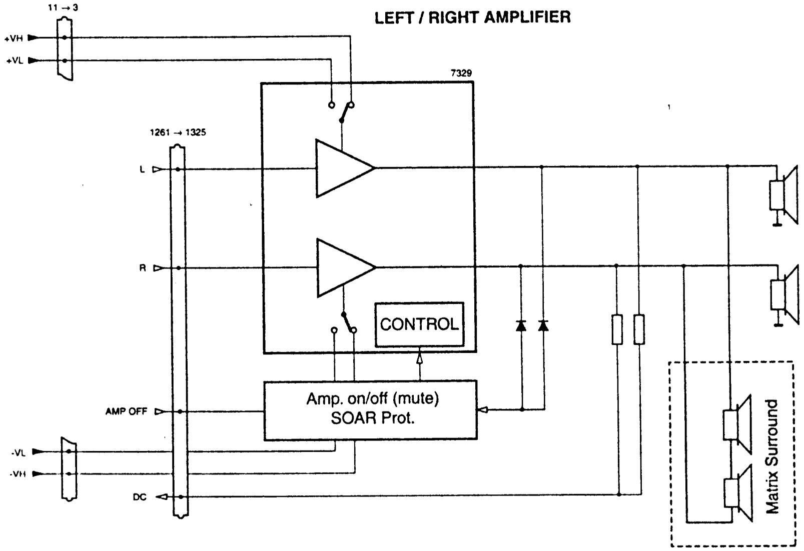
Power5 VA Wiring Diagram 22 01 199[illegible]

BLOCK DIAGRAM 70/100W VERSION

SUPPLY PART


Mains Transformer
with interconnection boards
1920
1921
1922
1923
1914 → 14
1911 → 8
6251
+VH
+VL
-VL
-VH
7282,7286
-30V
6284
6289,6290
Thermal fuse
Mains socket
1901
1905
Stand by
Relais
5903
3920
1912 → 10
F1
F2
NTC
1924
1925
1913 → 9
6260-6263
7251,7252,7254
+12A,+12M
7260,7253,7255
STANDBY
Stand by
Transformer
5903
6901-6904
27 → 1258
+V
6295
+5V
7281
+5,6V
6281
6905
6906
REL
7260,7263
STANDBY
PD
MFD
MFD=Mains Failure Detection
7280

LEFT / RIGHT AMPLIFIER


11 → 3
+VH
+VL
7329
1261 → 1325
L
R
CONTROL
Amp. on/off (mute)
SOAR Prot.
AMP OFF
-VL
-VH
DC
Matrix Surround

COMPONENT LAYOUT SUPPLY PART & L/R AMPLIFIER PART

9367 A 3
9368 A 3
9369 A 3
9370 A 2

T312 A 7
T314 A 10
T315 B 9
T316 A 10
—
16 A 4
1327 A 4
2357 A 5
3381 A 4
9360 A 2
9361 A 2
9362 A 2
9363 A 2
9364 A 4
9365 A 3
9366 A 3

9304 B 12
9305 A 10
9306 B 12
9307 B 10
9308 C 9
9309 B 8
9312 A 9
9313 A 8
9314 A 9
9315 B 9
9316 D 13
T256 C 13
T257 C 12
T258 D 13
T265 B 10
T305 A 11

9280 D 10
9281 D 10
9284 C 12
9285 C 12
9286 C 9
9287 C 10
9288 D 10
9289 B 11
9290 C 10
9291 C 9
9292 C 11
9298 E 8
9299 B 12
9300 B 12
9302 A 11
9303 B 11

9264 A 11
9265 E 12
9266 E 12
9267 E 12
9268 E 13
9269 E 12
9270 A 10
9271 E 11
9272 A 11
9273 E 12
9274 A 13
9275 C 10
9276 D 9
9277 B 11
9278 E 9
9279 E 10

7286 B 9
7290 D 7
7292 E 12
8328 C 9
9251 E 9
9252 E 8
9253 E 12
9254 C 7
9255 B 7
9256 E 12
9258 A 7
9259 B 9
9260 A 10
9261 A 12
9262 A 8
9263 A 11

7252 C 12
7253 A 8
7254 D 12
7255 C 12
7260 A 8
7262 B 13
7263 A 13
7265 A 7
7266 B 7
7268 A 7
7280 A 12
7281 E 11
7282 B 10
7283 A 10
7284 A 11
7285 A 11

6286 B 8
6287 B 8
6288 B 8
6289 B 10
6290 B 10
6292 D 7
6293 B 12
6294 B 13
6295 A 10
6296 A 9
6297 A 9
6298 B 7
6299 B 7
6301 B 11
6302 B 7
7251 E 13

6255 E 9
6260 D 13
6261 D 13
6262 C 13
6263 C 13
6264 C 11
6265 A 13
6267 A 13
6269 B 11
6270 B 12
6271 C 12
6272 A 10
6281 E 12
6283 B 11
6284 B 10
6285 B 8

3305 C 9
3306 A 8
3308 A 10
3309 B 7
3310 A 9
3311 A 10
3312 B 9
3313 B 12
3315 A 8
3316 A 8
3317 A 13
3318 A 9
3319 A 7
3320 A 7
6251 E 10
6252 B 13

3283 D 11
3284 D 11
3285 B 9
3286 B 10
3287 B 11
3288 B 10
3289 B 10
3290 E 8
3295 D 7
3298 D 7
3299 D 7
3300 D 7
3301 B 7
3302 B 7
3303 E 13
3304 B 9

3263 B 12
3265 B 12
3266 A 8
3267 A 8
3268 A 10
3270 C 12
3271 D 7
3272 E 13
3273 B 8
3274 E 8
3275 D 8
3278 D 13
3279 E 12
3280 A 13
3281 C 12
3282 C 7

2303 A 7
3248 A 11
3249 A 11
3250 A 11
3251 D 13
3252 D 12
3253 A 13
3254 B 7
3255 E 13
3256 B 13
3257 E 12
3258 E 12
3259 A 12
3260 C 12
3261 C 11
3262 C 12

2279 D 12
2280 C 12
2281 C 12
2282 D 11
2283 A 11
2284 C 8
2285 B 9
2286 A 10
2287 B 9
2288 A 13
2289 A 13
2290 D 7
2295 C 12
2300 B 7
2301 B 8
2302 A 9

2256 D 9
2257 D 8
2258 C 8
2259 D 10
2260 D 11
2261 C 11
2262 C 11
2263 B 13
2264 D 13
2265 C 13
2266 C 13
2267 D 12
2268 C 12
2269 C 12
2270 B 9
2271 A 12

14 D 9
1258 A 13
1261 C 6
1262 A 12
1263 A 7
1264 A 10
1265 C 9
1268 D 13
1280 C 7
1290 E 11
1291 C 9
2251 D 10
2252 E 10
2253 D 10
2254 D 9
2255 E 9

9349 B 2
9350 C 2
9351 D 5
9353 C 5
9354 C 2
9355 B 5
9356 D 5
9357 D 5
9358 E 4
9359 E 4
T321 A 1
—
8 D 9
9 B 13
10 B 10
11 D 8

9329 C 3
9331 C 5
9332 B 5
9333 B 5
9335 E 4
9336 E 3
9337 E 3
9338 E 4
9340 C 3
9342 D 5
9343 B 1
9344 D 3
9345 C 4
9346 D 4
9347 C 2
9348 B 5

7325 E 1
7326 E 2
7327 D 1
7328 C 1
7329 D 4
7330 C 4
7350 D 2
8327 E 4
9321 B 1
9322 B 1
9323 B 3
9324 C 3
9325 D 3
9326 C 4
9327 D 3
9328 C 2

5324 E 5
6325 C 3
6326 C 4
6327 B 4
6328 C 3
6329 B 4
6330 C 3
6333 E 4
6334 E 4
6335 E 4
6336 E 4
6337 D 1
6339 D 1
6360 D 5
7323 C 1
7324 C 1

3372 E 3
3373 C 1
3376 C 1
3377 B 5
3378 B 5
3379 B 5
3380 B 5
3383 D 1
3384 D 1
3385 C 5
3386 D 5
3387 D 6
3388 D 6
5321 C 5
5322 E 5
5323 C 5

3351 D 2
3352 D 1
3353 D 1
3355 C 3
3356 C 3
3357 E 1
3358 E 2
3363 C 5
3364 D 5
3365 D 5
3366 D 5
3367 D 1
3368 C 1
3369 B 5
3370 E 5
3371 E 3

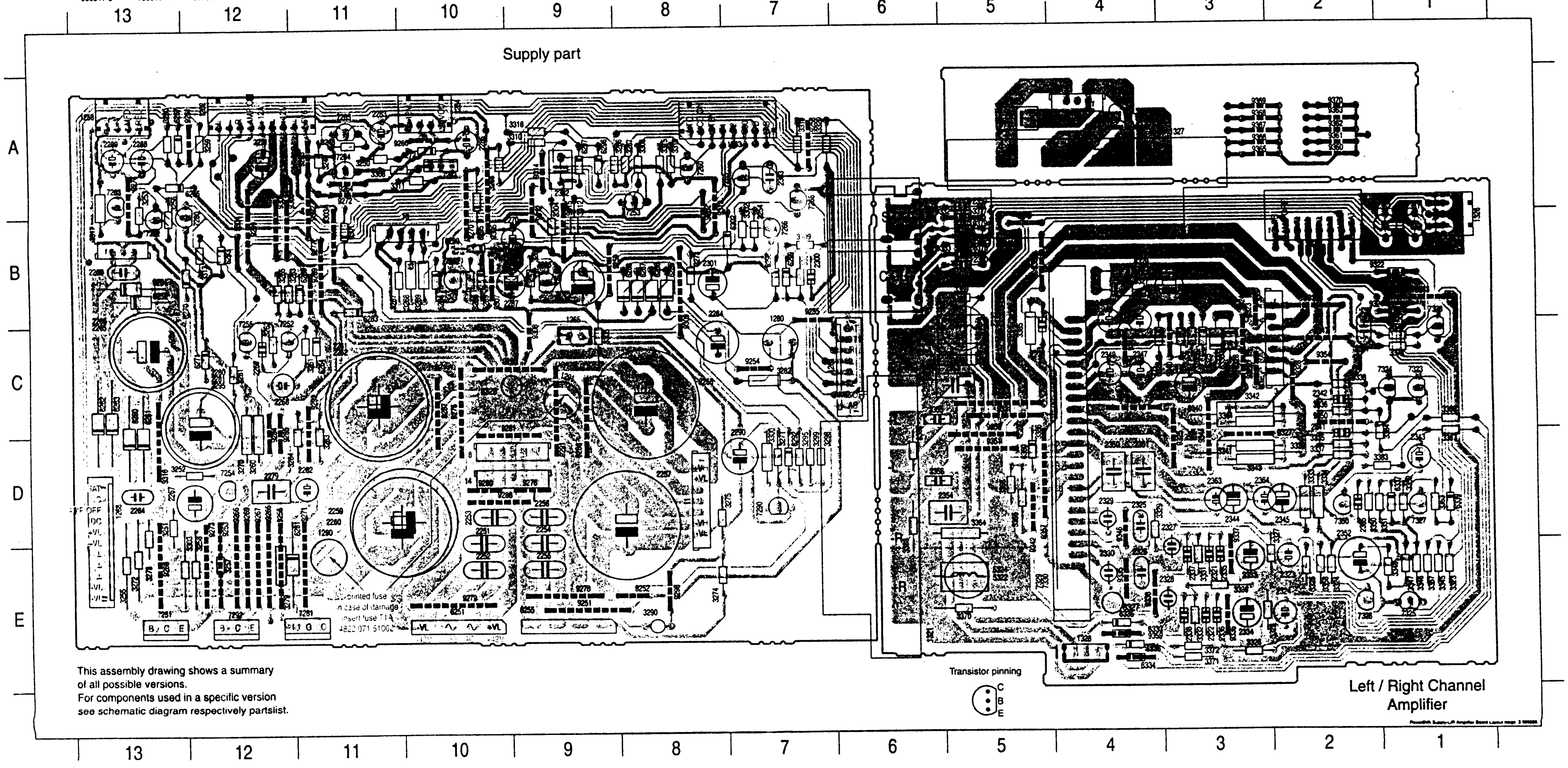
3334 D 2
3335 D 2
3336 C 2
3337 D 2
3338 C 2
3339 D 2
3340 C 2
3341 D 3
3342 C 3
3343 D 3
3344 C 3
3345 E 1
3346 E 1
3347 E 1
3348 E 1
3350 D 2

2364 D 3
2365 D 2
2366 C 5
3321 B 1
3322 B 1
3323 E 1
3324 E 2
3325 E 2
3326 E 3
3327 E 3
3328 E 3
3329 D 4
3330 E 3
3331 E 3
3332 E 3
3333 D 2

2346 C 4
2347 C 4
2348 C 4
2349 C 4
2350 D 4
2351 D 4
2352 E 2
2353 C 5
2354 D 5
2355 C 6
2356 D 6
2359 A 5
2360 B 5
2361 B 1
2362 B 1
2363 D 3

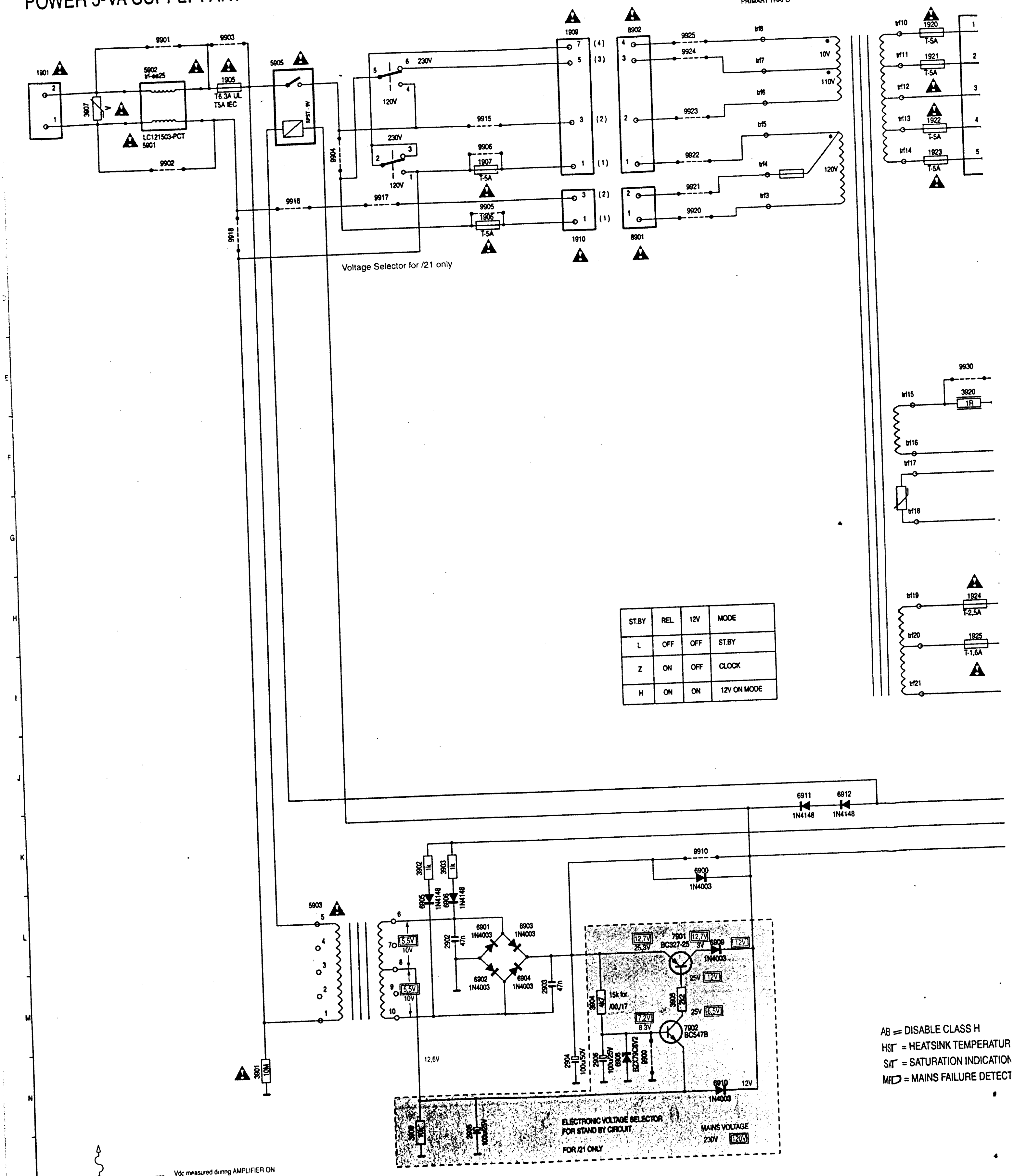
2329 D 4
2330 E 4
2331 C 2
2333 E 3
2334 E 3
2335 E 3
2336 E 3
2337 E 3
2338 E 3
2339 B 3
2340 C 3
2341 D 2
2342 C 2
2343 D 1
2344 D 3
2345 D 2

3 C 2
1321 D 6
1322 B 6
1323 B 6
1324 B 6
1325 B 2
1326 B 1
1328 E 4
2321 E 3
2322 E 3
2323 E 2
2324 E 2
2325 D 4
2326 E 4
2327 E 3
2328 E 3



This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

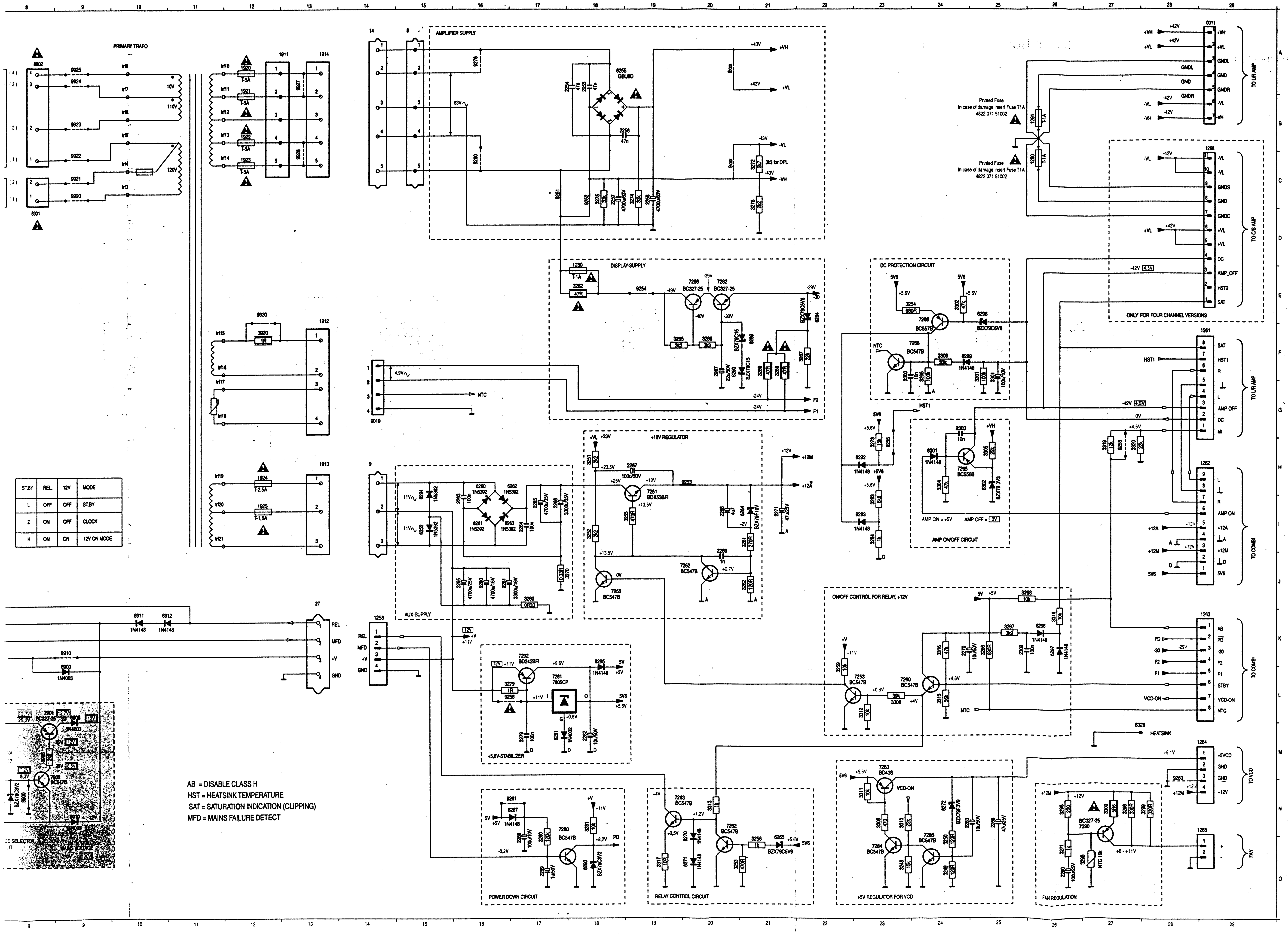
POWER 5-VA SUPPLY PART 70/100W Version


PRIMARY TRAFO
1901
2
1
3907
5902
trf-ea25
LC121503-PCT
5901
9901
9903
9902
1905
T6.3A UL
T5A IEC
5905
SPST - 9V
9904
9918
9916
9917
9915
6
230V
5
4
120V
230V
2
3
1
120V
9906
1907
T-5A
9905
1906
T-5A
1909
7 (4)
5 (3)
3 (2)
1 (1)
1910
3 (2)
1 (1)
8902
8901
9925
9924
9923
9922
9921
9920
trf8
trf7
trf6
trf5
trf4
trf3
10V
110V
120V
trf10
trf11
trf12
trf13
trf14
1920
1921
1922
1923
T-5A
Voltage Selector for /21 only
9930
trf15
3920
1R
trf16
trf17
trf18
trf19
1924
T-2,5A
trf20
1925
T-1,6A
trf21
6911
6912
1N4148
9910
6900
1N4003
3902
1k
3903
1k
6905
1N4148
6906
1N4148
5903
2902
47n
6901
1N4003
6903
1N4003
6902
1N4003
6904
1N4003
2903
47n
5.5V
10V
5.5V
10V
12,6V
7901
BC327-25
12,7V
25,3V
12,7V
3V
6909
12V
1N4003
25V
12V
3904
4K7
15k for
/00/17
3905
2K2
25V
6,5V
7,2V
8.3V
7902
BC547B
2904
100u/50V
2906
100u/25V
6908
BZX79C8V2
9909
6910
1N4003
12V
3901
10M
3906
2905
100u/25V
ELECTRONIC VOLTAGE SELECTOR
FOR STAND BY CIRCUIT
FOR /21 ONLY
MAINS VOLTAGE
230V
120V

ST.BY	REL.	12V	MODE
L	OFF	OFF	ST.BY
Z	ON	OFF	CLOCK
H	ON	ON	12V ON MODE

AB = DISABLE CLASS H
HST = HEATSINK TEMPERATUR
SAT = SATURATION INDICATION
MFD = MAINS FAILURE DETECT

EVM
.... Vdc measured during AMPLIFIER ON
V Vdc measured during AMPLIFIER OFF (mute)
Voltages measured at nominal mains voltage and low output signal


PRIMARY TRAFO
AMPLIFIER SUPPLY
DISPLAY-SUPPLY
DC PROTECTION CIRCUIT
AMP ON/OFF CIRCUIT
AMP ON = +5V AMP OFF = 0V
+12V REGULATOR
AUX-SUPPLY
ON/OFF CONTROL FOR RELAY, +12V
+5,6V-STABILIZER
POWER DOWN CIRCUIT
RELAY CONTROL CIRCUIT
+5V REGULATOR FOR VCD
FAN REGULATION
ONLY FOR FOUR CHANNEL VERSIONS
Printed Fuse
In case of damage insert Fuse T1A
4822 071 51002
TO L/R AMP
TO C/S AMP
TO COMBI
TO VCD
FAN
HEATSINK
GBU8D
BDX53BFI
BD242BFI
7805CP
BC327-25
BC547B
BC557B
BC556B
BD438
1N5392
1N4148
1N4003
1N4002
BZX79C5V6
BZX79C6V8
BZX79C15
BZX79F10V
BZX79F3V9
BZX79C8V2
BZX79 3V3
NTC 10k
+VH
+VL
-VL
-VH
GNDL
GND
GNDR
GNDS
GNDC
DC
AMP_OFF
HST2
SAT
HST1
R
L
AMP OFF
ab
AMP ON
+12A
+12M
5V6
AB
PD
-30
F2
F1
STBY
VCD-ON
NTC
+5VCD
+12V
REL
MFD
+V
E SELECTOR
+43V
-43V
+42V
-42V
-29V
-24V
3k3 for DPL

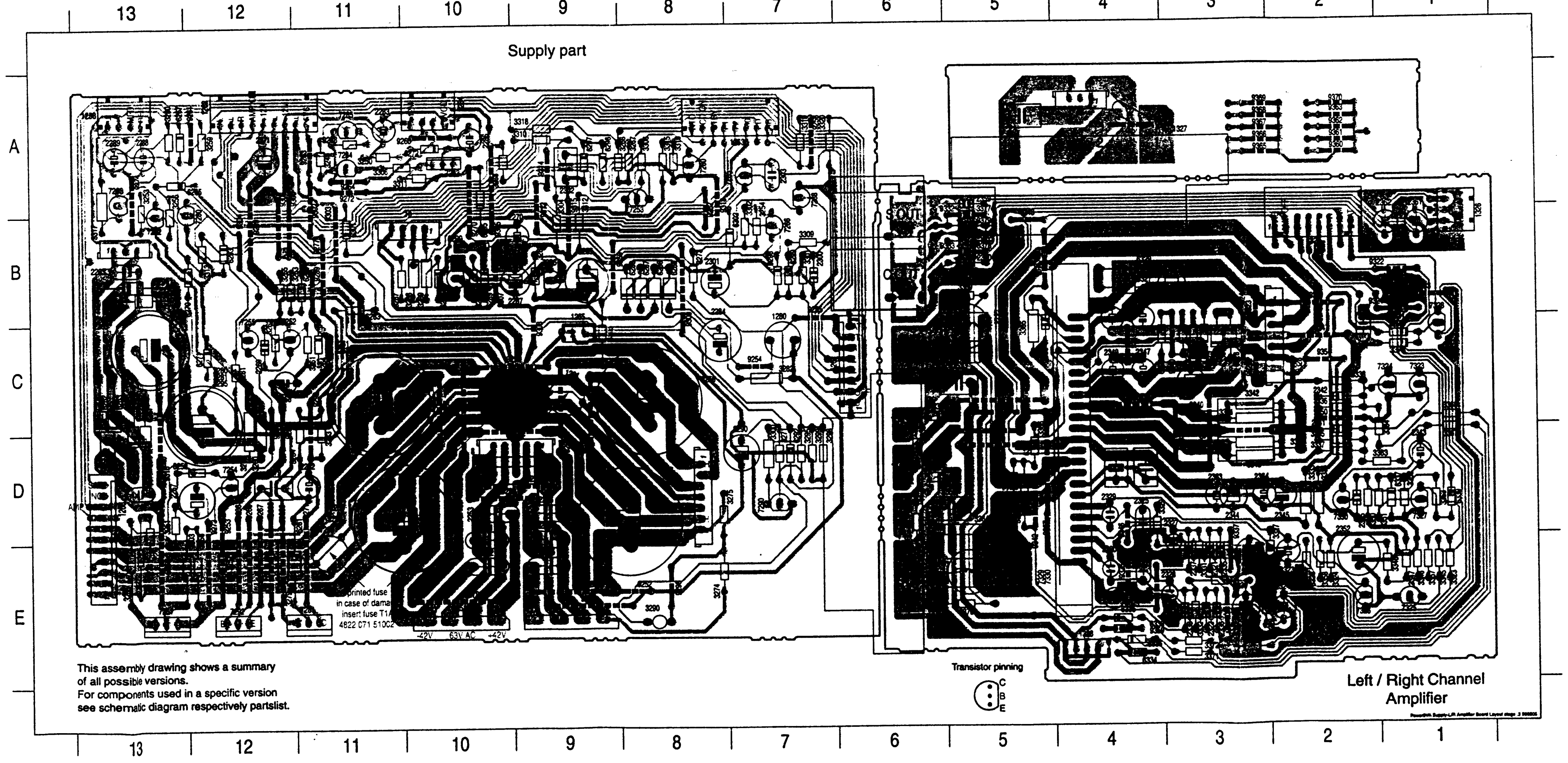
ST.BY	REL.	12V	MODE
L	OFF	OFF	ST.BY
Z	ON	OFF	CLOCK
H	ON	ON	12V ON MODE

AB = DISABLE CLASS H
HST = HEATSINK TEMPERATURE
SAT = SATURATION INDICATION (CLIPPING)
MFD = MAINS FAILURE DETECT

0010	G14
0011	B29
1258	K14
1261	F29
1262	H29
1263	M29
1264	M29
1265	N29
1268	B29
1280	E18
1290	C26
1291	B26
14	A14
1901	A 1
1905	A 3
1906	C 6
1907	C 6
1909	A 7
1910	D 7
1911	A13
1912	E13
1913	H13
1914	A13
1920	A12
1921	A12
1922	B12
1923	C12
1924	H12
1925	I12
2251	A16
2252	A16
2253	B17
2254	A18
2255	A18
2256	B19
2257	C18
2258	C19
2260	C20
2262	C20
2263	I16
2264	I17
2265	I17
2266	I17
2267	H19
2268	I20
2269	J20
2270	K24
2271	I21
2279	M17
2280	J16
2281	J16
2282	M18
2283	N24
2286	N25
2287	F20
2288	O17
2289	O17
2290	O26
2295	J16
2300	F23
2301	F25
2302	K25
2303	G24
27	J13
2902	L 6
2903	M 7
2904	N 7
2905	N 6
2906	N 7
3248	O23
3249	O24
3250	O24
3251	H18
3252	I18
3253	O20
3254	E24
3255	I19
3256	O21
3259	L22
3260	J17
3261	I21
3262	J21
3265	F24
3266	K25
3267	K25
3268	J26
3270	J18
3271	O26
3272	C21
3273	H23
3274	C19
3275	C18
3278	C21
3279	L17
3280	O17
3281	N18
3282	E18
3283	I23
3284	I23
3285	F19
3286	F20
3287	F22
3288	F21
3289	F21
3290	O26
3295	N26
3298	N27
3299	N28
3300	N27
3301	F25
3302	E24
3304	H24
3305	H25
3306	L23
3308	N23
3309	F24
3310	N23
3311	N23
3312	L23
3313	N20
3315	L24
3316	K24
3317	O19
3318	K26
3319	H27
3320	H27
3901	N 3
3902	K 5
3903	K 6
3904	M 7
3905	M 8
3906	N 5
3907	B 1
3920	F12
5901	B 2
5902	A 2
5903	L 4
5905	A 4
6251	A17
6252	I15
6255	A18
6260	H16
6261	I16
6262	H17
6263	I17
6264	I20
6265	N21
6267	N17
6270	O19
6271	O19
6272	N24
6281	M17
6283	I23
6284	E22
6289	F21
6290	F20
6292	H23
6293	O18
6294	H15
6295	K18
6296	K26
6297	K26
6298	E25
6299	F24
6301	H24
6302	H25
6900	K 9
6901	L 6
6902	M 6
6903	L 7
6904	M 8
6905	L 5
6906	L 5
6908	N 8
6909	L 9
6910	N 9
6911	K10
6912	K11
7251	H19
7252	J20
7253	L23
7255	J18
7260	L24
7262	N20
7263	N20
7265	H24
7266	E24
7268	F24
7280	N17
7281	L17
7282	E20
7283	M23
7284	O23
7285	O24
7286	E20
7290	N26
7292	K17
7901	L 8
7902	M 8
8	A15
8901	D 8
8902	A 8
9	H14
9251	C17
9252	C18
9253	H20
9254	E19
9255	H23
9256	L17
9258	H27
9260	N28
9261	N17
9276	A16
9280	C16
9900	N 8
9901	A 2
9902	B 2
9903	A 3
9904	B 4
9905	C 6
9906	B 6
9910	K 9
9911	F 1
9912	G 1
9913	G 1
9914	G 1
9915	B 6
9916	C 4
9917	C 5
9918	C 3
9920	C 9
9921	C 9
9922	C 9
9923	B 9
9924	A 9
9925	A 9
9927	A13
9928	C13
9930	E12
trf10	A11
trf11	A11
trf12	B11
trf13	B11
trf14	C11
trf15	F12
trf16	F11
trf17	G12
trf18	G11
trf19	H11
trf20	I11
trf21	I11
trf3	C10
trf4	C10
trf5	B10
trf6	B10
trf7	A10
trf8	A10

COMPONENT LAYOUT SUPPLY PART & L/R AMPLIFIER PART

9367	A	3
9368	A	3
9369	A	3
9370	A	2
T312	A	7
T314	A	10
T315	B	9
T316	A	10
—		
16	A	4
1327	A	4
2357	A	5
3381	A	4
9360	A	2
9361	A	2
9362	A	2
9363	A	2
9364	A	4
9365	A	3
9366	A	3
9304	B	12
9305	A	10
9306	B	12
9307	B	10
9308	C	9
9309	B	8
9312	A	9
9313	A	8
9314	A	9
9315	B	9
9316	D	13
T256	C	13
T257	C	12
T258	D	13
T265	B	10
T305	A	11
9280	D	10
9281	D	10
9284	C	12
9285	C	12
9286	C	9
9287	C	10
9288	D	10
9289	B	11
9290	C	10
9291	C	9
9292	C	11
9298	E	8
9299	B	12
9300	B	12
9302	A	11
9303	B	11
9264	A	11
9265	E	12
9266	E	12
9267	E	12
9268	E	13
9269	E	12
9270	A	10
9271	E	11
9272	A	11
9273	E	12
9274	A	13
9275	C	10
9276	D	9
9277	B	11
9278	E	9
9279	E	10
7286	B	9
7290	D	7
7292	E	12
8328	C	9
9251	E	9
9252	E	8
9253	E	12
9254	C	7
9255	B	7
9256	E	12
9258	A	7
9259	B	9
9260	A	10
9261	A	12
9262	A	8
9263	A	11
7252	C	12
7253	A	8
7254	D	12
7255	C	12
7260	A	8
7262	B	13
7263	A	13
7265	A	7
7266	B	7
7268	A	7
7280	A	12
7281	E	11
7282	B	10
7283	A	10
7284	A	11
7285	A	11
6286	B	8
6287	B	8
6288	B	8
6289	B	10
6290	B	10
6292	D	7
6293	B	12
6294	B	13
6295	A	10
6296	A	9
6297	A	9
6298	B	7
6299	B	7
6301	B	11
6302	B	7
7251	E	13
6255	E	9
6260	D	13
6261	D	13
6262	C	13
6263	C	13
6264	C	11
6265	A	13
6267	A	13
6269	B	11
6270	B	12
6271	C	12
6272	A	10
6281	E	12
6283	B	11
6284	B	10
6285	B	8
3305	C	9
3306	A	8
3308	A	10
3309	B	7
3310	A	9
3311	A	10
3312	B	9
3313	B	12
3315	A	8
3316	A	8
3317	A	13
3318	A	9
3319	A	7
3320	A	7
6251	E	10
6252	B	13
3283	D	11
3284	D	11
3285	B	9
3286	B	10
3287	B	11
3288	B	10
3289	B	10
3290	E	8
3295	D	7
3296	D	7
3299	D	7
3300	D	7
3301	B	7
3302	B	7
3303	E	13
3304	B	9
3263	B	12
3265	B	12
3266	A	8
3267	A	8
3268	A	10
3270	C	12
3271	D	7
3272	E	13
3273	B	8
3274	E	8
3275	D	8
3278	D	13
3279	E	12
3280	A	13
3281	C	12
3282	C	7
2303	A	7
3248	A	11
3249	A	11
3250	A	11
3251	D	13
3252	D	12
3253	A	13
3254	B	7
3255	E	13
3256	B	13
3257	E	12
3258	E	12
3259	A	12
3260	C	12
3261	C	11
3262	C	12
2279	D	12
2280	C	12
2281	C	12
2282	D	11
2283	A	11
2284	C	8
2285	B	9
2286	A	10
2287	B	9
2288	A	13
2289	A	13
2290	D	7
2295	C	12
2300	B	7
2301	B	8
2302	A	9
2256	D	9
2257	D	8
2258	C	8
2259	D	10
2260	D	11
2261	C	11
2262	C	11
2263	B	13
2264	D	13
2265	C	13
2266	C	13
2267	D	12
2268	C	12
2269	C	12
2270	B	9
2271	A	12
14	D	9
1258	A	13
1261	C	6
1262	A	12
1263	A	7
1264	A	10
1265	C	9
1268	D	13
1280	C	7
1290	E	11
1291	C	9
2251	D	10
2252	E	10
2253	D	10
2254	D	9
2255	E	9
9349	B	2
9350	C	2
9351	D	5
9353	C	5
9354	C	2
9355	B	5
9356	D	5
9357	D	5
9358	E	4
9359	E	4
T321	A	1
—		
8	D	9
9	B	13
10	B	10
11	D	8
9329	C	3
9331	C	5
9332	B	5
9333	B	5
9335	E	4
9336	E	3
9337	E	3
9338	E	4
9340	C	3
9342	D	5
9343	B	1
9344	D	3
9345	C	4
9346	D	4
9347	C	2
9348	B	5
7325	E	1
7326	E	2
7327	D	1
7328	C	1
7329	D	4
7330	C	4
7350	D	2
8327	E	4
9321	B	1
9322	B	1
9323	B	3
9324	C	3
9325	D	3
9326	C	4
9327	D	3
9328	C	2
5324	E	5
6325	C	3
6326	C	4
6327	B	4
6328	C	3
6329	B	4
6330	C	3
6333	E	4
6334	E	4
6335	E	4
6336	E	4
6337	D	1
6339	D	1
6360	D	5
7323	C	1
7324	C	1
3372	E	3
3373	C	1
3376	C	1
3377	B	5
3378	B	5
3379	B	5
3380	B	5
3383	D	1
3384	D	1
3385	C	5
3386	D	5
3387	D	6
3388	D	6
5321	C	5
5322	E	5
5323	C	5
3351	D	2
3352	D	1
3353	D	1
3355	C	3
3356	C	3
3357	E	1
3358	E	2
3363	C	5
3364	D	5
3365	D	5
3366	D	5
3367	D	1
3368	C	1
3369	B	5
3370	E	5
3371	E	3
3334	D	2
3335	D	2
3336	C	2
3337	D	2
3338	C	2
3339	D	2
3340	C	2
3341	D	3
3342	C	3
3343	D	3
3344	C	3
3345	E	1
3346	E	1
3347	E	1
3348	E	1
3350	D	2
2364	D	3
2365	D	2
2366	C	5
3321	B	1
3322	B	1
3323	E	1
3324	E	2
3325	E	2
3326	E	3
3327	E	3
3328	E	3
3329	D	4
3330	E	3
3331	E	3
3332	E	3
3333	D	2
2346	C	4
2347	C	4
2348	C	4
2349	C	4
2350	D	4
2351	D	4
2352	E	2
2353	C	5
2354	D	5
2355	C	6
2356	D	6
2359	A	5
2360	B	5
2361	B	1
2362	B	1
2363	D	3
2329	D	4
2330	E	4
2331	C	2
2333	E	3
2334	E	3
2335	E	3
2336	E	3
2337	E	3
2338	E	3
2339	B	3
2340	C	3
2341	D	2
2342	C	2
2343	D	1
2344	D	3
2345	D	2
3	C	2
1321	D	6
1322	B	6
1323	B	6
1324	B	6
1325	B	2
1326	B	1
1328	E	4
2321	E	3
2322	E	3
2323	E	2
2324	E	2
2325	D	4
2326	E	4
2327	E	3
2328	E	3



This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

COMPONENT LAYOUT MAINS BOARD

Interconnection Board

primary side

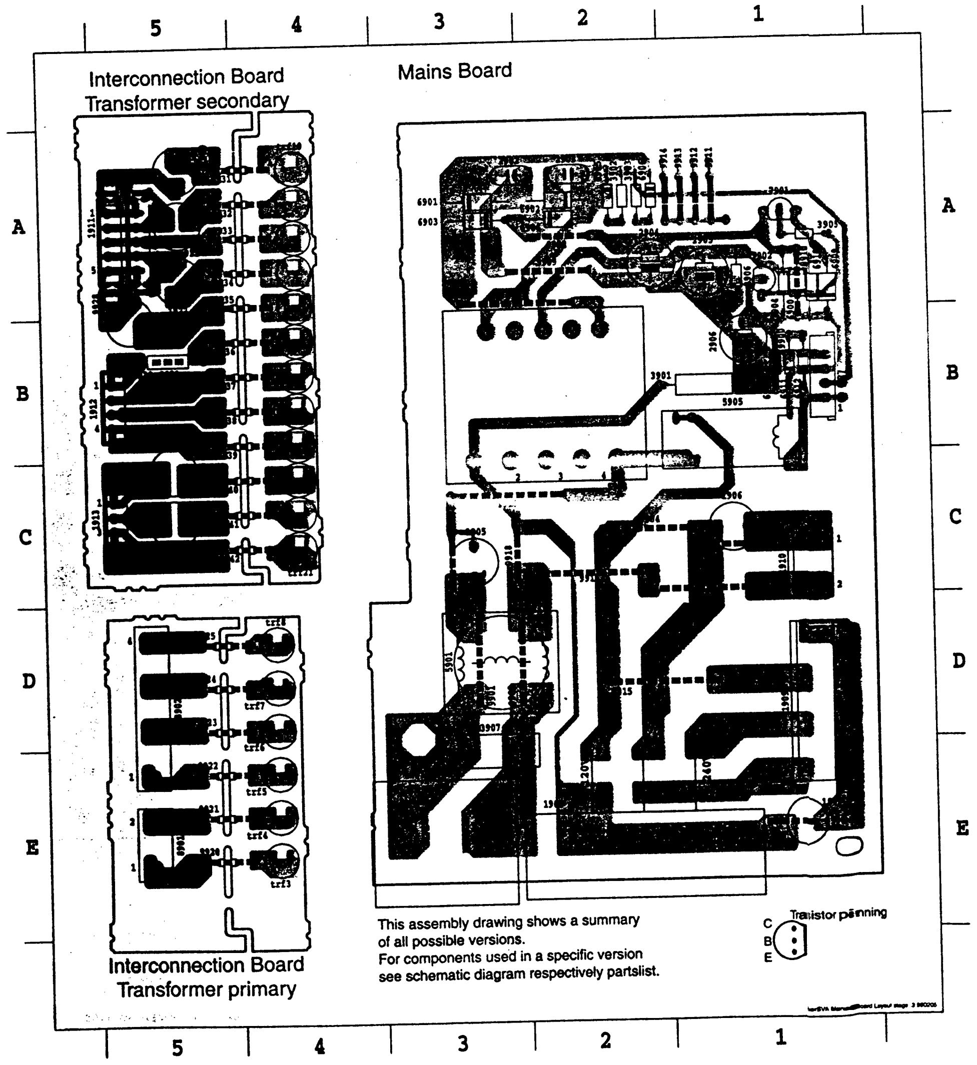
8901	E	5
8902	D	5
9920	E	4
9921	E	4
9922	E	4
9923	D	4
9924	D	4
9925	D	4
trf3	E	4
trf4	E	4
trf5	E	4
trf6	D	4
trf7	D	4
trf8	D	4

secondary side

1911	A	5
1912	B	5
1913	C	5
1914	A	5
1920	A	4
1921	A	4
1922	A	4
1923	B	5
1924	C	4
1925	C	4
3920	B	4
9927	A	5
9928	A	5
9930	B	4
9931	A	4
9932	A	4
9933	A	4
9934	A	4
9935	B	4
9936	B	4
9937	B	4
9938	B	4
9939	C	4
9940	C	4
9941	C	4
9942	C	4
trf10	A	3
trf11	A	3
trf12	A	3
trf13	A	3
trf14	B	3
trf15	B	3
trf16	B	3
trf17	B	3
trf18	C	3
trf19	C	3
trf20	C	3
trf21	C	3

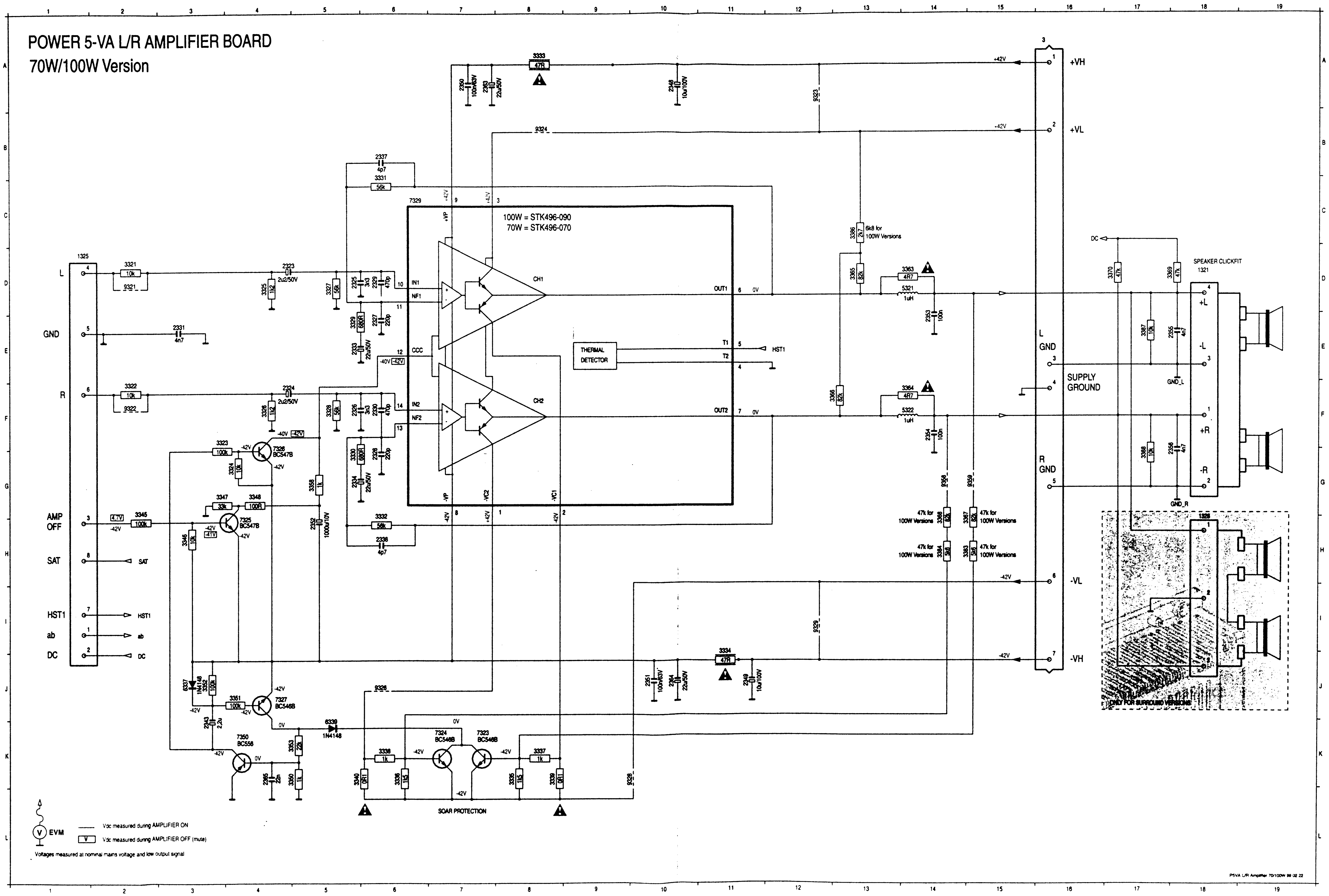
Mains Board

27	B	1
1901	E	3
1902	E	2
1905	C	3
1906	C	1
1907	E	1
1909	D	1
1910	C	1
2902	A	3
2903	A	2
2904	A	2
2905	A	1
2906	B	1
3901	B	1
3902	A	2
3903	A	2
3904	A	1
3905	A	1
3906	A	1
3907	E	3
5901	D	3
5902	D	3
5903	B	2
5905	B	1
6900	A	1
6901	A	3
6902	A	2
6903	A	3
6904	A	2
6905	A	2
6906	A	2
6908	B	1
6909	A	1
6910	A	1
6911	B	1
6912	B	1
7901	A	1
7902	A	1
9900	B	1
9901	D	3
9902	D	3
9903	C	3
9904	C	2
9905	C	1
9906	E	1
9907	A	3
9908	A	2
9909	A	2
9910	A	1
9911	A	1
9912	A	1
9913	A	1
9914	A	1
9915	D	2
9916	C	2
9917	C	1
9918	C	3
9919	C	3



This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

POWER 5-VA L/R AMPLIFIER BOARD
70W/100W Version


1325
L
GND
R
AMP OFF
SAT
HST1
ab
DC
3321 10k
9321
3322 10k
9322
2331 4n7
2323 2u2/50V
2324 2u2/50V
3325 1k2
3326 1k2
3327 56k
3328 56k
2325 3n3
2326 3n3
2329 470p
2330 470p
3329 680R
3330 680R
2327 220p
2328 220p
2333 22u/50V
2334 22u/50V
2337 4p7
3331 56k
3332 56k
2338 4p7
2332 1000u/10V
3358 1k
3323 100k
3324 10k
7326 BC547B
3347 33k
3348 100R
3345 100k
4.7V
-42V
-41V
-40V
7325 BC547B
3346 10k
6337 1N4148
3352 100k
3351 100k
7327 BC546B
2343 2.2u
7350 BC556
3353 22k
2365 22n
3350 1k
6339 1N4148
0V
7324 BC546B
7323 BC546B
3336 1k
3337 1k
3338 1k5
3335 1k5
3340 0R1
3339 0R1
SOAR PROTECTION
9325
9326
9328
7329
+42V
+VP
-VP
-VC2
-VC1
100W = STK496-090
70W = STK496-070
IN1
NF1
IN2
NF2
CCC
CH1
CH2
OUT1
OUT2
T1
T2
THERMAL DETECTOR
HST1
2350 100n/63V
2363 22u/50V
3333 47R
2348 10u/100V
9323
9324
+42V
2351 100n/63V
2364 22u/50V
3334 47R
2349 10u/100V
9329
-42V
3386 2k7
6k8 for 100W Versions
3365 82k
3366 82k
3363 4R7
3364 4R7
5321 1uH
5322 1uH
2353 100n
2354 100n
9358
9359
3368 82k
3367 82k
3384 5k6
3383 5k6
47k for 100W Versions
+VH
+VL
L GND
SUPPLY GROUND
R GND
-VL
-VH
DC
3370 47k
3369 47k
3387 10k
3388 10k
2355 4n7
2356 4n7
GND_L
GND_R
SPEAKER CLICKFIT
1321
+L
-L
+R
-R
1328
ONLY FOR SURROUND VERSIONS
P5VA L/R Amplifier 70/100W 99 02 22

EVM

Vdc measured during AMPLIFIER ON

V Vdc measured during AMPLIFIER OFF (mute)

Voltages measured at nominal mains voltage and low output signal

1321	D18
1325	D 1
1328	G18
2321	B 6
2322	H 6
2323	D 4
2324	F 4
2325	D 5
2326	F 5
2327	E 6
2328	G 6
2329	D 6
2330	F 6
2331	E 3
2333	E 5
2334	G 5
2335	B 6
2336	H 6
2337	B 6
2338	H 6
2341	K 7
2342	K 6
2343	K 3
2344	A 8
2345	J10
2346	B10
2347	I11
2348	A10
2349	J11
2350	A 7
2351	J10
2352	H 5
2353	E14
2354	F14
2355	E18
2356	G18
2363	A 7
2364	J10
2365	K 4
2366	C12
3	A16
3321	D 2
3322	F 2
3323	F 3
3324	G 4
3325	D 4
3326	F 4
3327	D 5
3328	F 5
3329	E 5
3330	G 5
3331	C 6
3332	H 6
3333	A 8
3334	J11
3335	K 8
3336	K 6
3337	K 8
3338	K 6
3339	K 8
3340	K 5
3345	G 2
3346	H 3
3347	G 3
3348	G 4
3350	K 5
3351	J 4
3352	J 3
3353	K 5
3355	C12
3356	I12
3358	G 5
3363	D14
3364	E14
3365	D13
3366	F13
3367	H15
3368	H14
3369	D18
3370	D17
3383	H15
3384	H14
3385	D12
3386	C13
3387	E17
3388	G17
5321	D14
5322	F14
5323	D14
5324	F14
6325	B12
6326	I12
6327	A13
6328	I13
6329	A13
6330	I13
6333	G14
6334	G14
6337	J 3
6339	K 5
6360	C12
7323	K 7
7324	K 7
7325	H 4
7326	G 4
7327	J 4
7329	C 6
7350	K 4
9321	D 2
9322	F 2
9323	A12
9324	J 6
9325	J 6
9326	J 6
9327	K 9
9328	K10
9329	I12
9331	D12
9358	G14
9359	G15

ELECTRICAL PARTS LIST - SUPPLY & LEFT/RIGHT AMPLIFIER BOARD

RESISTORS

3329	4822 116 52228		680R 5% 0,5W
3330	4822 116 52228		680R 5% 0,5W
3331	4822 116 52291		56k 5% 0,5W
3332	4822 116 52291		56k 5% 0,5W
3333	4822 052 10479	△	47R 5% 0,33W
3334	4822 052 10479	△	47R 5% 0,33W
3335	4822 116 52243		1k5 5% 0,5W
3336	4822 116 52243		1k5 5% 0,5W
3337	4822 050 11002		1k 1% 0,4W
3338	4822 050 11002		1k 1% 0,4W
3339	4822 113 80633	△	0R1 5% 3W
3340	4822 113 80633	△	0R1 5% 3W
3345	4822 116 52234		100k 5% 0,5W
3346	4822 116 83864		10k 5% 0,5W
3347	4822 116 52271		33k 5% 0,5W
3348	4822 116 83872		220R 5% 0,5W
3350	4822 050 11002		1k 1% 0,4W
3351	4822 116 52234		100k 5% 0,5W
3352	4822 116 52234		100k 5% 0,5W
3353	4822 116 52257		22k 5% 0,5W
3358	4822 050 11002	△	1k 1% 0,4W
3363	4822 053 10478	△	4R70 5% 1W
3364	4822 053 10478	△	4R70 5% 1W
3365	4822 116 52234		100k 5% 0,5W
3365	4822 116 52304		82k 5% 0,5W
3366	4822 116 52234		100k 5% 0,5W
3366	4822 116 52304		82k 5% 0,5W
3367	4822 116 83884		47k 5% 0,5W
3368	4822 116 83884		47k 5% 0,5W
3369	4822 116 83884		47k 5% 0,5W
3370	4822 116 83884		47k 5% 0,5W
3383	4822 116 83884		47k 5% 0,5W
3384	4822 116 83884		47k 5% 0,5W
3386	4822 116 83961		6k8 5%
3387	4822 116 83864		10k 5% 0,5W
3388	4822 116 83864		10k 5% 0,5W

COILS & FILTERS

5321	4822 157 70599	IND FXD BEAD EMI
5322	4822 157 70599	IND FXD BEAD EMI

DIODES

6252	5322 130 80686		1N5392
6255	4822 130 11139	△	GBU8D
6260	5322 130 80686		1N5392
6261	5322 130 80686		1N5392
6262	5322 130 80686		1N5392
6263	5322 130 80686		1N5392
6264	4822 130 61219		BZX79-B10
6270	4822 130 30621		1N4148
6271	4822 130 30621		1N4148
6281	4822 130 31878		1N4003G
6284	4822 130 34173		BZX79-B5V6
6289	4822 130 34281		BZX79-B15
6290	4822 130 34281		BZX79-B15
6292	4822 130 30621		1N4148
6293	4822 130 34382		BZX79-B8V2
6294	5322 130 80686		1N5392
6295	4822 130 30621		1N4148
6298	4822 130 34278		BZX79-B6V8
6299	4822 130 30621		1N4148
6301	4822 130 30621		1N4148
6302	5322 130 31504		BZX79-B3V3
6337	4822 130 30621		1N4148
6339	4822 130 30621		1N4148
6360	4822 130 34281		BZX79-B15

TRANSISTORS & INTEGRATED CIRCUITS

7251	4822 130 10812	BDX53BFI
7252	4822 130 40959	BC547B
7253	4822 130 40959	BC547B
7255	4822 130 40959	BC547B
7260	4822 130 40959	BC547B
7263	4822 130 40959	BC547B
7265	4822 130 41691	BC556B
7266	4822 130 44568	BC557B
7268	4822 130 40959	BC547B
7280	4822 130 40959	BC547B
7281	4822 209 31841	L7805CP
7282	4822 130 41246	BC327-25
7286	4822 130 41246	BC327-25
7290	4822 130 41246	BC327-25
7323	4822 130 44461	BC546B
7324	4822 130 44461	BC546B
7325	4822 130 40959	BC547B
7326	4822 130 40959	BC547B
7327	4822 130 44461	BC546B
7329	4822 209 17383	STk47-090I
7329	4822 209 17385	STK496-070
7350	4822 130 41691	BC556B

Note : Only the parts mentioned in this list are normal service spare parts.

AF7 BOARD

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BRIEF INTRODUCTION OF THE AF7 BOARD

The AF7 Board consists of the following features :

a. TDA7437 AUDIO PROCESSOR IC
TDA7437 audio processor IC (7511) includes functions such as source selection, loudness control, dynamic bass control, treble control, front/rear volume control and muting function. Sound features such as DBB, DSC and IS are controllable via I²C bus.

b. MIC. MIXING
The AF7 Board can provide simple karaoke (without echo) which caters for mic. mixing with additional mic. amplifier board.

c. DOLBY PRO LOGIC (DPL)
Dolby Pro Logic (DPL) function is provided by IC M62460FP (7711). Delay circuit is also integrated into the same IC.

d. LINE OUT
Line out cinch socket is included for connection to external devices such as amplifier, recorders etc.

e. SUB-WOOFER OUT
Sub-woofer cinch socket is included for connection to active sub-woofer speaker.

f. INCREDIBLE SURROUND
Incredible surround effect using transistor circuit to create phase shifting and spatial effect.

g. HEADPHONE AMPLIFIER
A headphone can be driven by Op-amp NJM4556AM.

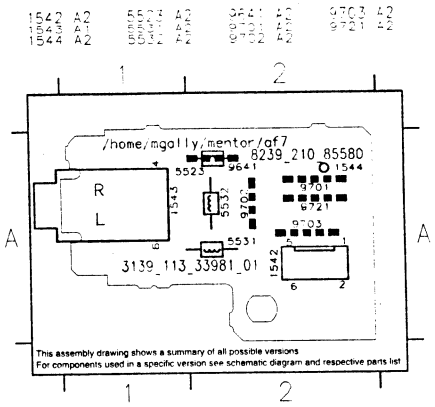
h. CD STANDBY CONTROL
Control circuit that switches on the supply to CD servo IC, HF circuit and the laser light pen in CD mode only.

i. HEADPHONE SENSING
Headphone sense circuit is for switching off DPL modes when headphone is plugged in.

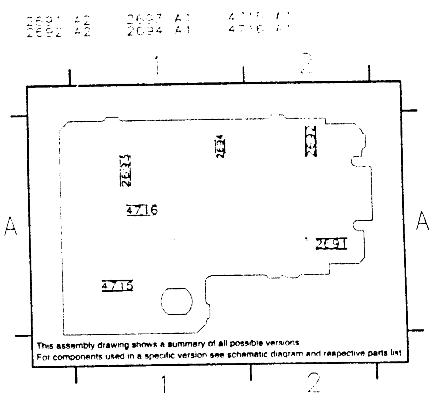
j. ATTENUATION NETWORK
Attenuation network is provided at the output of the AF7 Board for interfacing with power modules.

k. BASS AUTOMATIC LEVEL CONTROL (ALC)
This circuit will defeat the bass effect if it sense that there is excessive amount of bass frequencies present in the left and right audio channel. This will prevent excessive speaker excursions under high volume condition.

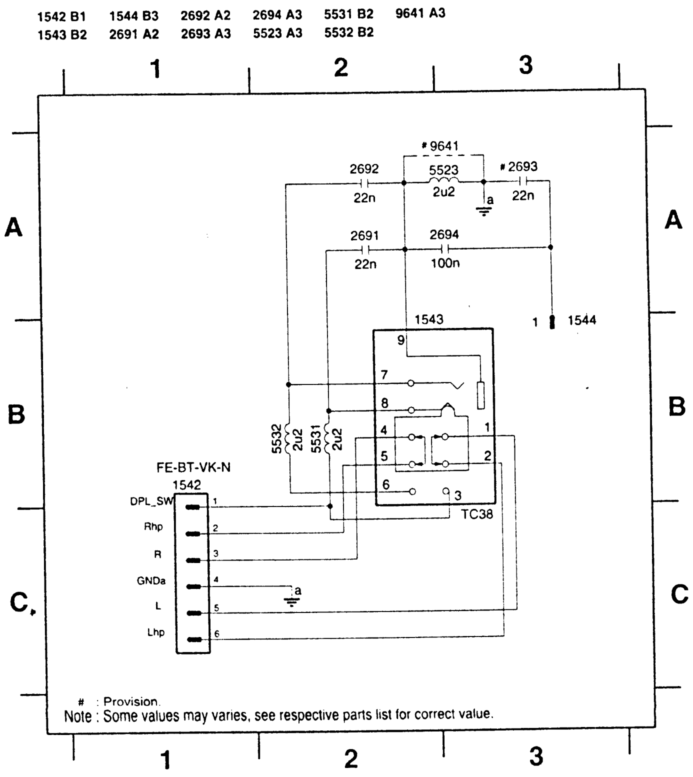
HEADPHONE BOARD - COMPONENT LAYOUT


1542 A2
1543 A1
1544 A2
5523 A2
5531 A2
5532 A2
9641 A2
9701 A2
9702 A2
9703 A2
9721 A2
1
2
A
/home/mgolly/mentor/af7
8239_210_85580
5523
9641
1544
R
L
1543
5532
9702
9701
9721
9703
5531
3139_113_33981_01
1542
6
2
This assembly drawing shows a summary of all possible versions
For components used in a specific version see schematic diagram and respective parts list

HEADPHONE BOARD - CHIP LAYOUT

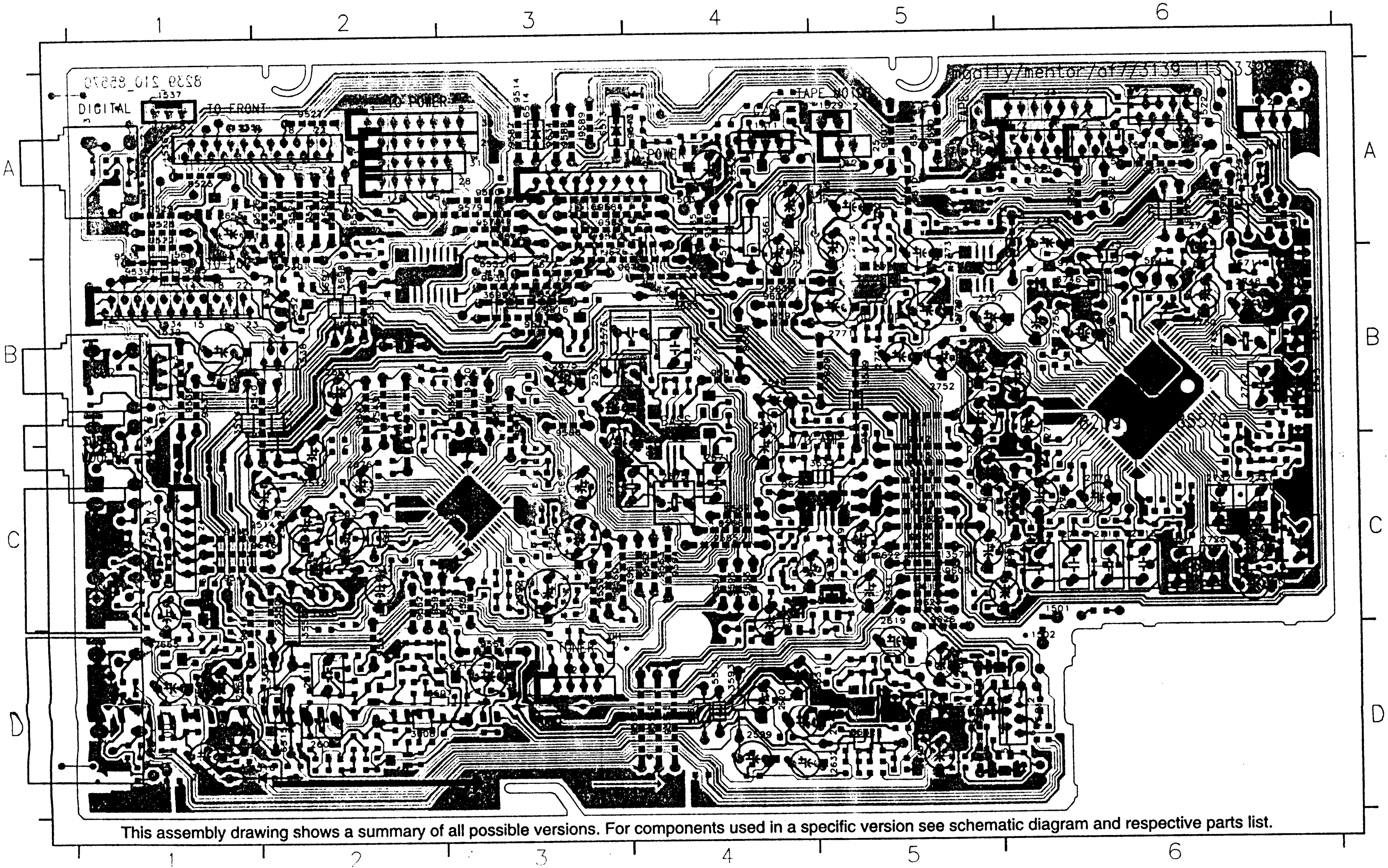

2691 A2
2692 A2
2693 A1
2694 A1
4715 A1
4716 A1
1
2
A
4716
2691
4715
This assembly drawing shows a summary of all possible versions
For components used in a specific version see schematic diagram and respective parts list

HEADPHONE BOARD - CIRCUIT DIAGRAM


1542 B1
1543 B2
1544 B3
2691 A2
2692 A2
2693 A3
2694 A3
5523 A3
5531 B2
5532 B2
9641 A3
1
2
3
A
B
C
#9641
2692
22n
5523
2u2
a
#2693
22n
2691
22n
2694
100n
1543
1544
9
7
8
4
5
6
1
2
3
TC38
5532
2u2
5531
2u2
FE-BT-VK-N
1542
DPL_SW
Rhp
R
GNDa
L
Lhp
# : Provision
Note : Some values may varies, see respective parts list for correct value.

AF7 BOARD - COMPONENT LAYOUT

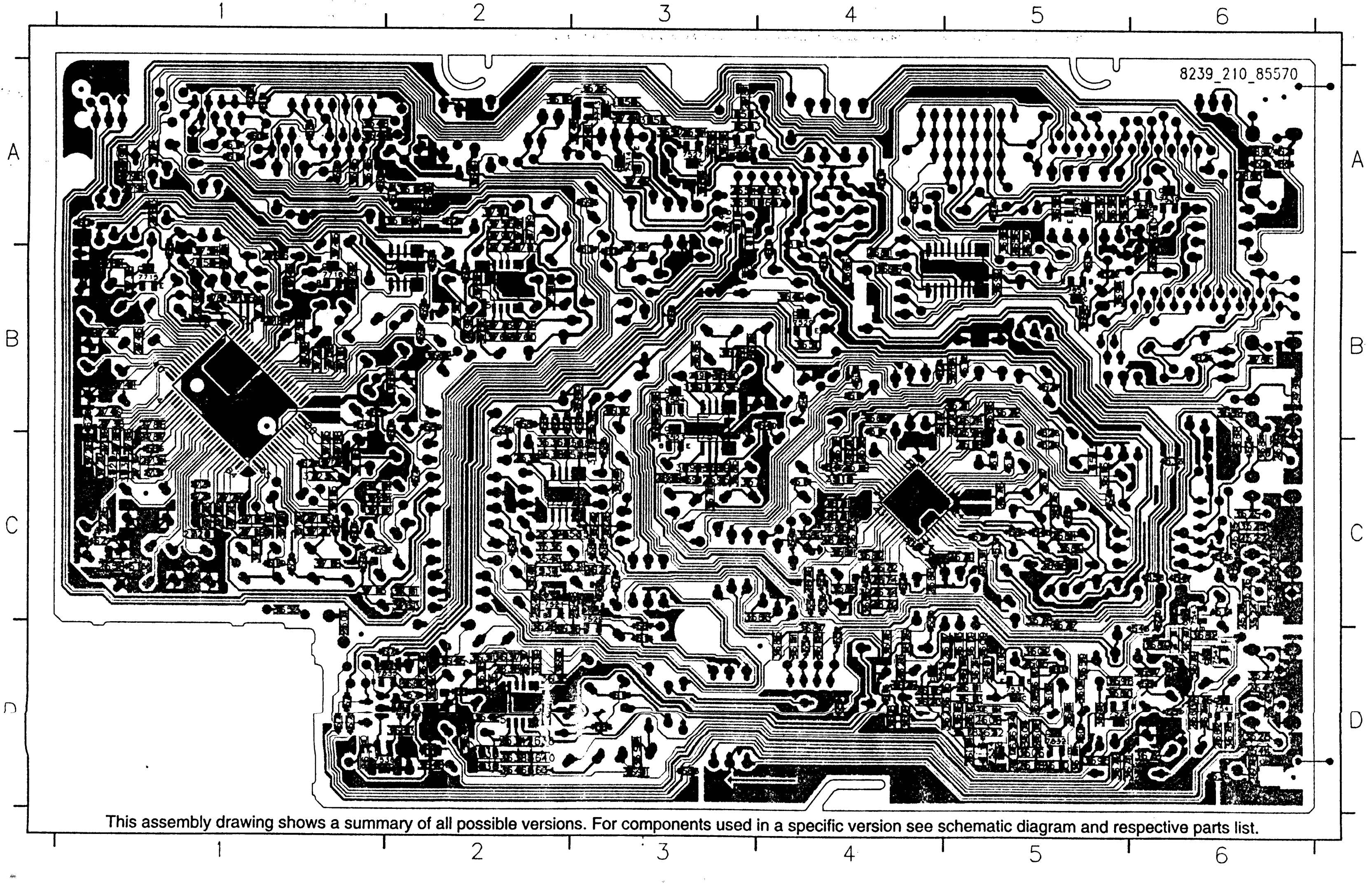
21 D3	1504 D1	1535 A1	2534 B4	2573 C3	2619 C5	2666 D1	2731 C6	2757 B5	2780 B4	3608 D2	3745 A6	6515 D2	9517 B3	9530 B2	9545 C1	9559 C3	9572 B3	9585 A4	9599 A6	9618 C5	9635 B3
23 A6	1521 A6	1536 A1	2540 B4	2574 B4	2620 D4	2675 B3	2732 C6	2758 A6	2790 B6	3632 D5	3746 B6	6516 D2	9518 B2	9531 C4	9546 C2	9560 C3	9573 B3	9586 A4	9600 A6	9620 C5	9636 B4
24 C1	1522 A6	1537 A1	2541 C5	2575 C4	2621 D3	2676 C2	2735 C6	2762 B6	2876 B1	3641 D3	3752 B5	6517 A4	9519 A6	9532 C6	9547 C1	9561 C3	9574 B4	9587 A3	9601 A6	9621 B5	9711 B6
25 A5	1523 A6	1538 B2	2542 C4	2576 B3	2631 D4	2711 C6	2742 B6	2765 C5	3513 B2	3655 A2	3772 A6	6531 B3	9520 A2	9533 C4	9549 C1	9562 C4	9575 B4	9588 A3	9602 A5	9622 C5	9712 A6
26 A6	1525 C1	1539 B1	2546 A5	2582 C2	2632 D5	2712 C6	2743 B6	2766 C6	3514 B1	3661 A4	3773 A6	6711 B6	9521 A2	9535 A1	9550 C2	9563 C4	9576 A3	9589 A3	9605 B4	9624 C5	
27 A3	1526 D1	1711 A4	2549 C5	2583 C2	2640 D5	2713 C6	2744 B6	2767 B6	3533 C5	3681 D2	5511 D4	7525 C2	9522 A1	9536 B2	9551 D2	9564 C4	9577 A3	9590 A5	9608 C5	9625 C5	
28 A3	1527 B1	1712 B1	2550 C6	2591 C3	2641 D5	2714 C6	2745 B6	2769 B5	3539 B5	3685 B4	5611 A1	7552 B2	9523 A2	9537 B1	9552 C2	9565 C4	9578 A3	9591 A6	9609 B5	9626 C5	
29 A3	1528 D6	2513 C2	2552 A4	2592 C3	2647 D5	2717 C6	2748 B6	2770 C6	3558 C2	3695 B1	5711 B6	9511 B5	9524 A2	9538 B1	9553 C3	9566 C4	9579 A3	9592 B4	9610 A5	9627 C4	
30 A3	1529 A5	2514 C2	2560 D1	2593 C4	2648 D5	2718 C5	2749 A6	2771 B5	3576 D4	3697 B2	5712 B6	9512 A6	9525 A1	9539 B1	9554 D3	9567 C4	9580 A3	9593 C4	9612 C5	9628 C5	
31 A3	1531 A1	2521 A4	2563 C3	2594 B4	2655 A1	2727 C6	2750 B6	2772 B5	3579 C5	3698 B2	6511 A5	9513 A4	9526 A2	9540 B1	9555 D4	9568 B3	9581 B4	9594 C2	9613 C5	9631 B4	
1501 C6	1532 B1	2522 A5	2564 B2	2599 D4	2661 D1	2728 C6	2751 B6	2773 B5	3593 D4	3699 B3	6512 C2	9514 A3	9527 A2	9542 B2	9556 D4	9569 B3	9582 A3	9595 A6	9615 C5	9632 B2	
1502 D6	1533 B2	2532 C2	2571 C4	2609 D2	2664 D1	2729 C6	2752 B5	2774 B5	3599 C2	3737 A6	6513 A3	9515 B3	9528 A1	9543 B2	9557 D4	9570 B3	9583 A3	9597 A6	9616 C5	9633 D5	
1503 A4	1534 B1	2533 C5	2572 B3	2610 D2	2665 D1	2730 C6	2756 B6	2779 A5	3607 D2	3739 A5	6514 A3	9516 B3	9529 A1	9544 C1	9558 C3	9571 B3	9584 A3	9598 A6	9617 C5	9634 A3	



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

AF7 BOARD - CHIP LAYOUT

2501 D1	2544 D6	2608 D5	2651 A3	2721 C1	2768 C1	2866 A6	3525 C6	3549 A2	3574 B3	3601 D5	3625 D4	3651 A3	3679 D6	3718 C1	3744 A3	4515 C1	4537 C5	4559 D6	4581 C2	4603 A1	4627 C1	7538 A6
2511 B4	2545 D6	2611 D5	2652 A4	2722 C1	2775 A2	2867 A6	3526 C6	3550 B4	3575 D4	3602 D5	3626 D4	3652 A4	3680 D6	3719 C1	3748 B1	4516 D2	4538 B4	4560 C5	4582 C3	4604 A1	4628 B1	7539 A6
2512 C5	2547 C2	2612 D5	2656 A5	2723 C1	2776 B2	2868 C5	3527 D6	3551 A3	3577 C5	3603 D5	3627 D4	3653 C1	3582 D6	3720 C1	3751 B2	4517 B4	4539 D6	4561 D6	4583 C3	4605 C1	4629 A2	7541 D6
2515 C4	2548 C3	2613 D5	2657 A5	2724 C1	2777 A2	2869 C3	3528 D6	3552 A3	3578 C5	3604 D5	3628 D4	3656 A5	3683 B6	3721 C1	3753 B2	4518 C5	4540 B4	4562 C5	4584 A1	4606 A1	7511 C4	7542 D6
2516 C5	2551 A3	2614 D5	2658 C1	2725 C1	2778 B2	2870 C4	3529 D2	3553 A3	3580 C5	3605 D5	3629 D4	3657 A5	3684 C6	3722 C1	3754 B1	4519 C1	4541 B4	4563 D3	4585 C3	4607 B3	7512 C2	7543 C6
2517 C4	2553 A3	2615 D4	2662 D6	2726 C1	2781 A3	2871 C4	3530 D2	3554 A3	3581 C4	3606 D5	3631 D2	3658 A5	3686 D4	3723 C1	3755 A2	4520 C1	4542 C4	4564 D3	4586 B3	4609 B3	7513 C3	7551 B5
2519 C4	2577 C5	2616 D5	2663 D6	2733 C1	2782 B1	2872 C4	3531 C3	3555 A3	3582 C4	3609 D5	3633 D2	3659 A5	3687 D4	3724 C1	3756 B2	4521 A6	4543 C4	4565 C3	4587 B2	4610 A4	7515 D2	7553 B5
2520 B5	2578 C5	2617 D5	2668 C6	2734 C1	2783 A1	2873 C4	3532 B3	3556 A3	3583 C4	3610 D5	3634 D2	3660 A6	3688 A2	3725 C1	3757 A2	4522 B5	4544 C5	4566 C1	4588 B2	4611 A1	7521 C2	7711 B1
2523 C4	2579 C5	2618 D5	2669 C6	2737 C1	2784 B1	2874 C4	3534 C3	3557 A3	3584 C4	3611 D5	3635 D2	3662 D2	3689 A2	3726 C1	3758 B2	4523 C1	4545 C5	4567 D3	4589 B2	4612 A2	7522 C3	7712 B2
2524 B5	2580 C4	2623 C4	2670 C5	2738 B1	2785 B1	2875 C5	3535 C2	3559 D5	3585 C3	3612 D5	3636 D2	3663 D2	3690 D2	3727 C1	3759 A2	4524 A6	4546 C6	4568 D2	4590 A1	4613 D3	7523 C3	7713 A3
2525 C6	2581 C5	2624 B5	2671 C4	2739 C1	2786 C1	3511 D4	3536 C2	3560 D5	3586 B3	3613 D5	3637 D2	3665 B4	3691 D3	3728 C1	3760 B2	4525 C6	4547 C6	4569 D2	4591 B3	4614 D3	7524 B3	7714 A3
2526 C6	2595 C3	2625 C3	2672 C4	2740 B1	2787 C1	3512 D4	3537 C2	3561 B2	3587 B3	3614 D5	3638 D2	3666 A5	3692 B5	3729 C1	3761 A2	4526 C1	4548 D6	4570 D2	4592 C1	4615 D4	7526 A3	7715 B1
2527 C6	2596 B3	2626 C3	2673 C4	2741 B1	2788 C1	3515 C5	3538 C3	3562 B2	3588 B3	3615 D5	3639 D2	3667 B4	3693 B5	3732 B1	3762 B2	4527 B5	4549 B1	4571 D2	4593 C1	4616 A3	7527 A3	7716 B1
2528 C6	2597 C3	2633 D2	2674 C4	2746 B1	2789 B1	3516 C5	3540 B4	3563 C4	3589 C3	3616 D5	3640 D2	3668 B5	3694 B5	3733 B1	3763 C2	4528 B5	4550 C4	4572 D1	4594 B2	4617 B3	7528 D5	7717 B2
2529 C6	2598 B3	2634 D2	2677 B4	2747 B1	2792 B1	3517 A2	3541 C2	3564 B5	3590 B3	3617 D5	3642 D2	3671 D5	3696 B4	3734 B1	3764 C1	4529 C5	4551 D4	4573 D1	4595 A3	4618 A1	7529 B4	
2531 C5	2601 D5	2635 D2	2678 D6	2753 B1	2793 A1	3518 A2	3542 C3	3565 C4	3591 C3	3618 D5	3643 D2	3672 D5	3711 C2	3735 B1	3765 B6	4530 B5	4552 D4	4574 D1	4596 B2	4619 A1	7531 D5	
2535 C3	2602 D5	2636 D2	2681 B4	2754 B1	2794 A1	3519 A2	3543 C2	3566 C4	3592 B3	3619 D5	3645 D2	3673 D6	3712 C1	3736 C1	3774 A1	4531 A4	4553 C4	4575 D2	4597 B2	4620 C6	7532 D5	
2536 C3	2603 D5	2637 D2	2682 B6	2755 B1	2795 A1	3520 A3	3544 C3	3569 B3	3594 D3	3620 D5	3646 D2	3674 D6	3713 C1	3738 B1	3775 A1	4532 A4	4554 B1	4576 C3	4598 B2	4621 B2	7533 D4	
2537 C2	2604 D5	2638 D2	2715 C1	2759 B1	2796 B1	3521 B5	3545 A1	3570 B3	3595 D5	3621 D5	3647 D2	3675 D6	3714 C1	3740 A3	4511 C4	4533 C6	4555 C4	4577 C2	4599 B2	4622 C4	7534 D5	
2538 C2	2605 D5	2639 D2	2716 C1	2760 B6	2797 A2	3522 B5	3546 A1	3571 C3	3596 D5	3622 D5	3648 D2	3676 D6	3715 C1	3741 A3	4512 B5	4534 B4	4556 C4	4578 B2	4600 B2	4623 C4	7535 D2	
2539 C2	2606 D5	2649 D2	2719 C1	2761 B1	2798 B2	3523 C6	3547 A1	3572 B3	3597 D6	3623 D4	3649 A3	3677 D6	3716 C1	3742 A3	4513 D6	4535 C6	4557 D4	4579 A5	4601 A4	4624 B4	7536 D1	
2543 D6	2607 D5	2650 D1	2720 C1	2763 B1	2865 A6	3524 C6	3548 A1	3573 C3	3598 D5	3624 D5	3650 B3	3678 D6	3717 C1	3743 A3	4514 C6	4536 C6	4558 C6	4580 B1	4602 A1	4625 B6	7537 A5	



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

AF7 BOARD - CIRCUIT DIAGRAM (PART 1)

21	E1
23	A3
24	C3
25	A2
26	H1
27	F21
28	I20
29	I20
30	I21
31	I20
1501	J9
1502	J10
1503	J10
1504	G1
1521	B1
1522	I1
1523	A2
1525-A	C1
1525-B	D1
1526-A	G2
1526-B	H2
1527	H20
1528	D21
1529	A1
2501	J9
2511	E2
2512	E2
2513	D4
2514	F4
2515	D4
2516	F4
2517	F11
2519	E4
2520	F4
2521	E4
2522	F4
2523	C5
2524	D5
2525	C3
2526	D3
2527	C3
2528	D3
2529	D1
2531	F12
2532	G12
2533	C7
2534	H7
2535	C7
2536	I7
2537	B6
2538	H6
2539	I6
2540	J13
2541	C6
2542	I6
2543	G3
2544	H3
2545	H1
2546	B4
2547	G4
2548	H4
2549	A6
2550	J6
2551	J4
2552	I3
2553	J4
2560	G14
2563	D7
2564	G7
2571	B10
2572	H9
2573	B11
2574	H9
2575	B11
2576	H9
2577	C8
2578	G8
2579	C13
2580	G13
2581	H11
2582	H11
2583	H10
2591	C10
2592	H10
2593	B9
2594	I9
2595	A10
2596	H9
2597	B9
2598	I9
2599	G16
2601	E13
2602	E13
2603	C14
2604	E14
2605	C14
2606	F14
2607	B15
2608	E15
2609	D14
2610	F14
2611	D14
2612	F14
2613	D15
2614	F15
2615	C15
2616	F15
2617	C16
2618	F15
2619	B16
2620	F16
2621	J14
2623	C5
2624	C5
2625	C7
2626	I7
2631	B16
2632	E16
2633	B17
2634	E17
2635	B17
2636	F17
2637	C18
2638	E17
2639	F18
2640	F18
2641	J14
2647	B18
2648	E18
2649	C19
2650	D19
2651	F19
2652	G19
2655	C19
2656	E21
2657	E20
2658	H11
2661	G17
2662	H18
2663	H17
2664	H17
2665	H18
2666	G18
2668	H19
2669	G19
2670	D11
2671	C8
2672	G8
2673	C9
2674	G9
2675	D8
2676	G8
2677	E6
2678	G1
2868	D10
2869	C9
2870	G9
2871	C9
2872	G9
2873	C9
2874	G9
2875	G10
2876	J11
3511	E2
3512	F2
3513	D4
3514	F3
3515	E4
3516	F4
3517	E3
3518	F3
3519	J6
3520	J6
3521	C4
3522	D4
3523	C3
3524	D3
3525	C2
3526	D2
3527	G3
3528	H3
3529	H4
3530	H4
3531	C7
3532	H7
3533	C7
3534	I7
3535	B6
3536	H6
3537	B7
3538	H7
3539	I7
3540	H5
3541	C6
3542	I6
3543	A7
3544	J7
3545	B4
3546	B4
3547	B4
3548	B4
3549	A4
3550	H5
3551	J6
3552	J5
3553	J4
3554	I4
3555	I3
3556	J3
3557	J4
3558	H15
3559	H15
3560	I15
3561	A6
3562	J7
3563	B7
3564	J7
3565	C9
3566	G9
3569	I12
3570	J12
3571	B10
3572	I9
3573	B11
3574	I9
3575	C13
3576	G13
3577	E11
3578	E12
3579	H2
3580	G11
3581	C9
3582	H9
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3588	J9
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3593	F16
3594	F16
3595	G14
3596	H14
3597	G14
3598	H14
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3605	C14
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3609	C14
3610	F14
3611	E13
3612	E13
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3656	C20
3657	B20
3658	B20
3659	B19
3660	C19
3661	B18
3662	C18
3663	D18
3665	E20
3666	E20
3667	C4
3668	D4
3671	F18
3672	F18
3673	G18
3674	H17
3675	G17
3676	H17
3677	H17
3678	H18
3679	H18
3680	G18
3681	G19
3682	H18
3683	H19
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4618	B4
4619	B5
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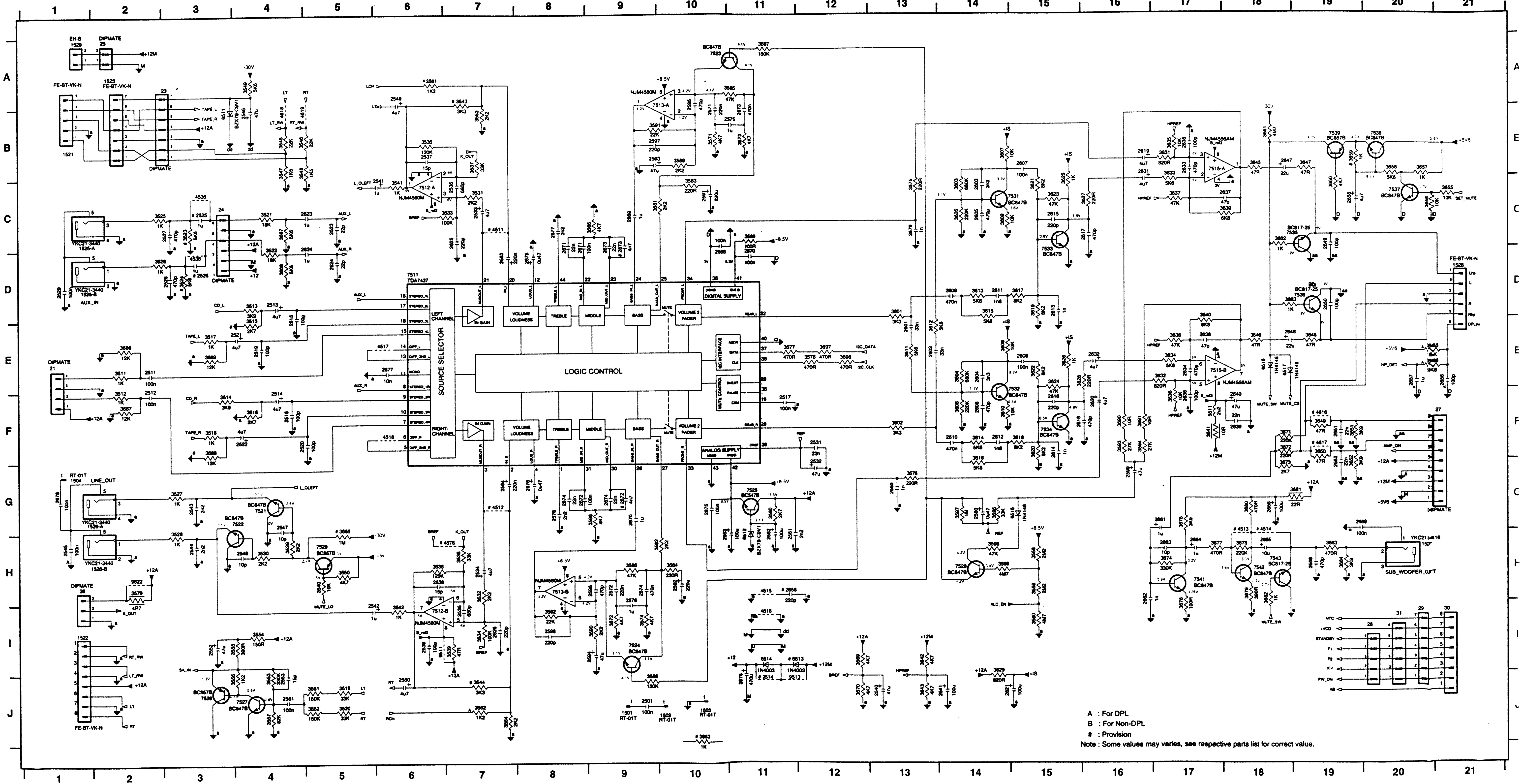
6611	B3
6612	H11
6613	I11
6614	I11
6615	G15
6616	E18
6617	E18
7511	D6
7512-A	C6
7512-B	I7
7513-A	B10
7513-B	H8
7515-A	B17
7515-B	E17
7521	G4
7522	G4
7523	A10
7524	I9
7525	G11
7526	J3
7527	J4
7528	H14
7529	H5
7531	C14
7532	F14
7533	D15
7534	F15
7535	C18
7536	D19
7537	C20
7538	B20
7539	B19
7541	H17
7542	H18
7543	H18
9611	I6
9613	J11
9514	J11
9622	H2



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A
B
C
D
E
F
G
H
I
J
EH-B
1529
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25
+12M
M
FE-BT-VK-N
1523
1521
23
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TAPE_R
+12A
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-30V
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RT
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RT_RW
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RIGHT-CHANNEL
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TREBLE
MIDDLE
BASS
VOLUME 2 FADER
MUTE
DIGITAL SUPPLY
ANALOG SUPPLY
LOGIC CONTROL
I2C INTERFACE
MUTE CONTROL
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I2C_CLK
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STEREO_2L
STEREO_3L
STEREO_4L
DIFF_L
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BC857B
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7527
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MUTE_CS
HP_DET
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+12A
+12M
+5V5
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28
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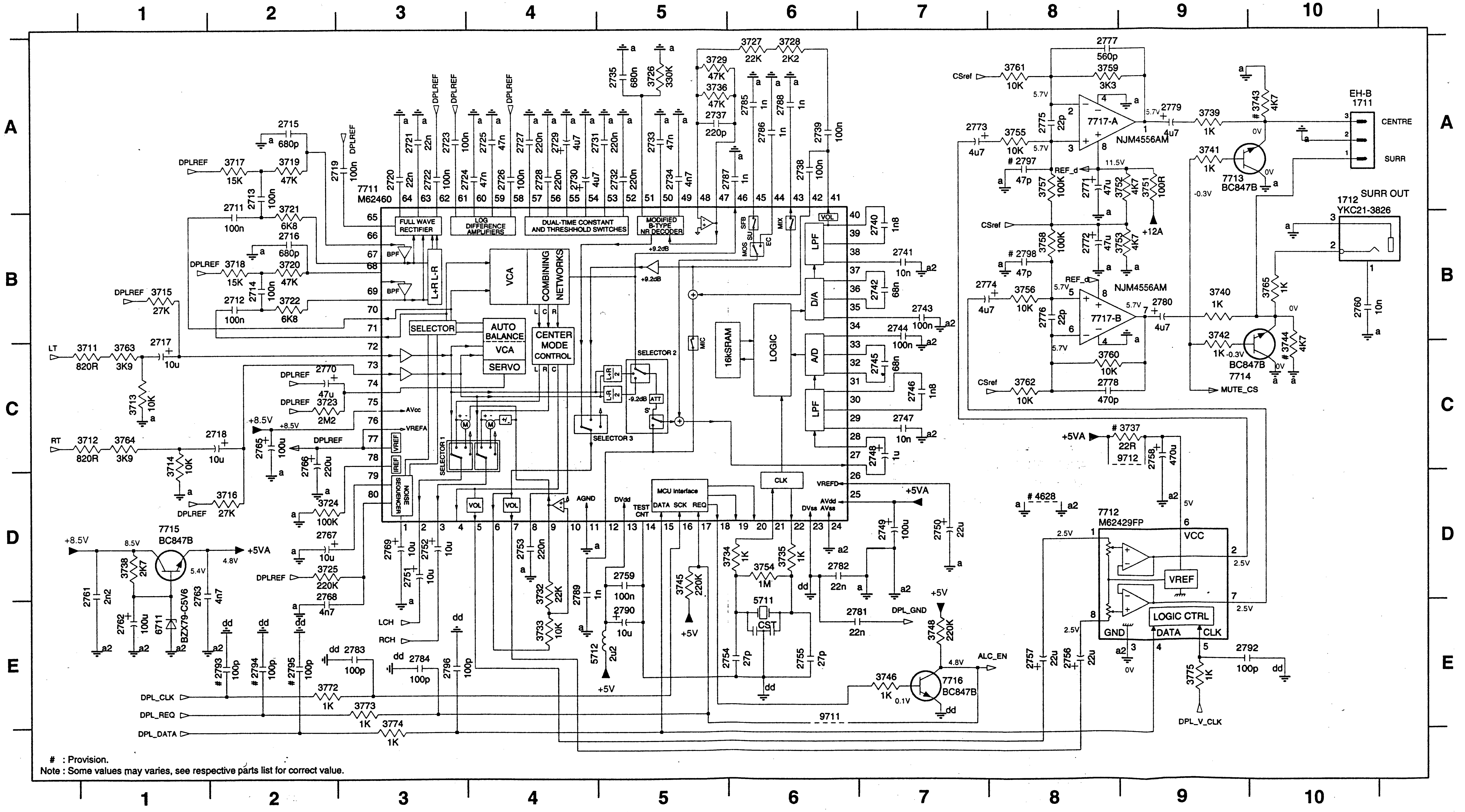
1N4148

A : For DPL
B : For Non-DPL
: Provision
Note : Some values may varies, see respective parts list for correct value.

DOLBY PROLOGIC (DPL) - CIRCUIT DIAGRAM

1711	A10
1712	A10
2711	A2
2712	B2
2713	A2
2714	B2
2715	A2
2716	B2
2717	C1
2718	C2
2719	A3
2720	A3
2721	A3
2722	A3
2723	A3
2724	A4
2725	A4
2726	A4
2727	A4
2728	A4
2729	A4
2730	A4
2731	A5
2732	A5
2733	A5
2734	A5
2735	A5
2737	A5
2738	A6
2739	A6
2740	B7
2741	B7
2742	B7
2743	B7
2744	B7
2745	C7
2746	C7
2747	C7
2748	C7
2749	D7
2750	D7
2751	D3
2752	D3
2753	D4
2754	E6
2755	E6
2756	E8
2757	E8
2758	C9
2759	D5
2760	B10
2761	D1
2762	E1
2763	D1
2765	C2
2766	C2
2767	D2
2768	D2
2769	D3
2770	C2
2771	A8
2772	B8
2773	A7
2774	B7
2775	A8
2776	B8
2777	A8
2778	C8
2779	A9
2780	B9
2781	E6
2782	D6
2783	E3
2784	E3
2785	A6
2786	A6
2787	A6
2788	A6
2789	D4
2790	E5
2792	E9
2793	E2
2794	E2
2795	E2
2796	E3
2797	A8
2798	B8
3711	C1
3712	C1
3713	C1
3714	C1
3715	B1
3716	D2
3717	A2
3718	B2
3719	A2
3720	B2
3721	A2
3722	B2
3723	C2
3724	D2
3725	D2
3726	A5
3727	A6
3728	A6
3729	A5
3732	D4
3733	E4
3734	D6
3735	D6
3736	A5
3737	C9
3738	D1
3739	A9
3740	B9
3741	A9
3742	B9
3743	A10
3744	C10
3745	D5
3746	E7
3748	E7
3751	A9
3752	A9
3753	B9
3754	D6
3755	A8
3756	B8
3757	A8
3758	B8
3759	A8
3760	C8
3761	A8
3762	C8
3763	C1
3764	C1
3765	B10
3772	E2
3773	E3
3774	E3
3775	E9
4628	D8
5711	E6
5712	E4
6711	E1
7711	A3
7712	D8
7713	A9
7714	C9
7715	D1
7716	E7
7717-A	A8
7717-B	B8
9711	E6
9712	C9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3
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6
7
8
9
10
A
B
C
D
E
7711
M62460
FULL WAVE RECTIFIER
LOG DIFFERENCE AMPLIFIERS
DUAL-TIME CONSTANT AND THRESHHOLD SWITCHES
MODIFIED B-TYPE NR DECODER
VCA
COMBINING NETWORKS
L+R L-R
BPF
SELECTOR
AUTO BALANCE
SERVO
CENTER MODE CONTROL
SELECTOR 1
SELECTOR 2
SELECTOR 3
16kSRAM
LOGIC
D/A
A/D
LPF
VOL
CLK
MCU Interface
DATA SCK REQ
NOISE SEQUENCER
VREF
IREF
AGND
DVdd
TEST CNT
DVss AVss
AVdd
VREFD
MIC
ATT
+9.2dB
-9.2dB
DPLREF
LT
RT
3711 820R
3763 3K9
2717 10u
3712 820R
3764 3K9
2718 10u
3713 10K
3714 10K
3715 27K
3716 27K
3717 15K
3718 15K
3719 47K
3720 47K
3721 6K8
3722 6K8
2711 100n
2712 100n
2715 680p
2716 680p
2719 100n
+8.5V
+5VA
7715
BC847B
3738 2K7
6711
BZX79-C5V6
2761 2n2
2762 100u
2763 4n7
DPL_CLK
DPL_REQ
DPL_DATA
3772 1K
3773 1K
3774 1K
LCH
RCH
5711
CST
3754 1M
5712 2u2
+5V
7716
BC847B
ALC_EN
DPL_GND
3748 220K
3746 1K
9711
CSref
7717-A
7717-B
NJM4556AM
REF_d
+12A
EH-B
1711
CENTRE
SURR
1712
YKC21-3826
SURR OUT
7713
BC847B
7714
MUTE_CS
7712
M62429FP
VCC
LOGIC CTRL
GND
DATA
CLK
DPL_V_CLK
# 3737 22R
9712
# 4628
a
a2
dd

: Provision.
Note : Some values may varies, see respective parts list for correct value.

MISCELLANEOUS

1523	4822 267 10953	Flex Connector 7P
1525	4822 267 20452	Cinch Socket - Aux in
1526	4822 267 20452	Cinch Socket - Line-out
1527	4822 267 31729	Cinch Socket - Sub-Woofer out
1528	4822 267 10731	Flex Connector 6P
1531	4822 267 31729	Cinch Socket - Digital out
1534	4822 265 11553	Flex Connector 19P
1535	4822 265 11553	Flex Connector 19P
1542	4822 267 10731	Flex Connector 6P
1543	4822 265 11529	Headphone Socket

CAPACITORS

2501	4822 126 10002	100nF 20% 25V
2511	4822 126 10002	100nF 20% 25V
2512	4822 126 10002	100nF 20% 25V
2513	4822 124 40769	4,7µF 20% 100V
2514	4822 124 40769	4,7µF 20% 100V
2515	5322 122 32531	100pF 5% 50V
2516	5322 122 32531	100pF 5% 50V
2517	4822 126 13196	100nF 10% 25V
2519	5322 122 32531	100pF 5% 50V
2520	5322 122 32531	100pF 5% 50V
2521	4822 124 40769	4,7µF 20% 100V
2522	4822 124 40769	4,7µF 20% 100V
2523	5322 122 32658	22pF 5% 50V
2524	5322 122 32658	22pF 5% 50V
2527	5322 122 34099	470pF 10% 63V
2528	5322 122 34099	470pF 10% 63V
2529	4822 126 10002	100nF 20% 25V
2531	4822 122 33809	22nF 20% 50V
2532	4822 124 40433	47µF 20% 25V
2533	4822 124 40769	4,7µF 20% 100V
2534	4822 124 40769	4,7µF 20% 100V
2535	4822 122 32535	680pF 10% 63V
2536	4822 122 32535	680pF 10% 63V
2537	4822 126 13486	15pF 2% 63V
2538	4822 126 13486	15pF 2% 63V
2539	5322 122 32531	100pF 5% 50V
2540	4822 124 40433	47µF 20% 25V
2541	4822 124 40242	1µF 20% 63V
2542	4822 124 40242	1µF 20% 63V
2543	4822 122 33175	2,2nF 20% 50V
2544	4822 122 33175	2,2nF 20% 50V
2545	4822 126 10002	100nF 20% 25V
2546	4822 124 41751	47µF 20% 50V
2547	5322 122 32448	10pF 5% 63V
2548	5322 122 32448	10pF 5% 63V
2549	4822 124 40769	4,7µF 20% 100V
2550	4822 124 40769	4,7µF 20% 100V
2551	4822 126 13196	100nF 10% 25V
2552	4822 124 41751	47µF 20% 50V
2553	4822 126 13486	15pF 2% 63V
2560	5322 124 41948	470nF 20% 50V
2563	4822 124 40746	0,22µF 20% 63V
2564	4822 124 40746	0,22µF 20% 63V
2571	4822 121 42408	220nF 5% 63V
2572	4822 121 42408	220nF 5% 63V
2573	4822 121 51252	470nF 5% 63V
2574	4822 121 51252	470nF 5% 63V
2575	4822 121 51319	1µF 10% 63V
2576	4822 121 51319	1µF 10% 63V
2577	4822 122 33175	2,2nF 20% 50V
2578	4822 122 33175	2,2nF 20% 50V
2579	5322 122 34123	1nF 10% 50V
2580	5322 122 34123	1nF 10% 50V
2581	4822 122 33175	2,2nF 20% 50V
2582	4822 124 81029	100µF 20% 25V
2583	4822 124 81029	100µF 20% 25V
2591	4822 124 22263	220µF 20% 25V
2592	4822 124 22263	220µF 20% 25V
2593	4822 124 40433	47µF 20% 25V
2594	4822 124 40433	47µF 20% 25V
2595	5322 122 34099	470pF 10% 63V
2596	5322 122 34099	470pF 10% 63V
2597	4822 122 33575	220pF 5% 63V
2598	4822 122 33575	220pF 5% 63V
2599	4822 124 41751	47µF 20% 50V
2601	4822 126 12105	33nF 5% 50V
2602	4822 126 12105	33nF 5% 50V
2603	4822 122 33891	3,3nF 10% 63V
2604	4822 122 33891	3,3nF 10% 63V
2605	5322 122 34099	470pF 10% 63V
2606	5322 122 34099	470pF 10% 63V
2607	4822 126 13196	100nF 10% 25V
2608	4822 126 13196	100nF 10% 25V
2609	4822 121 51252	470nF 5% 63V
2610	4822 121 51252	470nF 5% 63V
2611	4822 126 10847	1,8nF 10% 63V
2612	4822 126 10847	1,8nF 10% 63V
2613	5322 122 34123	1nF 10% 50V
2614	5322 122 34123	1nF 10% 50V
2615	4822 122 33575	220pF 5% 63V
2616	4822 122 33575	220pF 5% 63V
2617	5322 122 34099	470pF 10% 63V
2618	5322 122 34099	470pF 10% 63V
2619	4822 124 40769	4,7µF 20% 100V
2620	4822 124 40769	4,7µF 20% 100V
2621	4822 124 81029	100µF 20% 25V
2623	4822 126 13836	1µF 16V
2624	4822 126 13836	1µF 16V
2625	4822 122 33575	220pF 5% 63V
2626	4822 122 33575	220pF 5% 63V

2631	4822 124 40769	4,7µF 20% 100V
2632	4822 124 40769	4,7µF 20% 100V
2633	5322 122 34099	470pF 10% 63V
2634	5322 122 34099	470pF 10% 63V
2635	5322 122 32531	100pF 5% 50V
2636	5322 122 32531	100pF 5% 50V
2637	4822 126 13692	47pF 1% 63V
2638	4822 126 13692	47pF 1% 63V
2639	4822 122 33809	22nF 20% 50V
2640	4822 124 40433	47µF 20% 25V
2641	4822 124 81029	100µF 20% 25V
2647	4822 124 81151	22µF 50V
2648	4822 124 81151	22µF 50V
2649	5322 122 32531	100pF 5% 50V
2650	5322 122 32531	100pF 5% 50V
2651	4822 122 33809	22nF 20% 50V
2652	4822 122 33809	22nF 20% 50V
2655	4822 124 40769	4,7µF 20% 100V
2661	4822 124 40242	1µF 20% 63V
2662	5322 122 34123	1nF 10% 50V
2663	5322 122 32448	10pF 5% 63V
2664	4822 124 40242	1µF 20% 63V
2665	4822 124 41579	10µF 20% 50V
2666	4822 124 81029	100µF 20% 25V
2668	5322 122 34099	470pF 10% 63V
2669	4822 126 10002	100nF 20% 25V
2670	4822 126 10002	100nF 20% 25V
2671	4822 126 10002	100nF 20% 25V
2672	4822 126 10002	100nF 20% 25V
2673	4822 122 33809	22nF 20% 50V
2674	4822 122 33809	22nF 20% 50V
2675	5322 124 41948	470nF 20% 50V
2676	5322 124 41948	470nF 20% 50V
2677	4822 122 33808	10nF 20% 50V
2678	4822 126 13196	100nF 10% 25V
2681	4822 126 13196	100nF 10% 25V
2682	4822 122 33808	10nF 20% 50V
2691	4822 122 33809	22nF 20% 50V
2692	4822 122 33809	22nF 20% 50V
2693	4822 122 33809	22nF 20% 50V
2694	4822 126 10002	100nF 20% 25V
2781	4822 122 33809	22nF 20% 50V
2784	5322 122 32531	100pF 5% 50V
2865	5322 122 32531	100pF 5% 50V
2866	4822 122 33797	47nF 20% 50V
2867	4822 122 33797	47nF 20% 50V
2868	4822 126 13196	100nF 10% 25V
2869	4822 126 13836	1µF 16V
2870	4822 126 13836	1µF 16V
2871	5322 122 32654	22nF 10% 63V
2872	5322 126 10223	4,7nF 10% 63V
2873	5322 126 10223	4,7nF 10% 63V
2874	5322 122 32654	22nF 10% 63V
2876	4822 124 80791	470µF 20% 16V

RESISTORS

3511	4822 051 10102	1k 2% 0,25W
3512	4822 051 10102	1k 2% 0,25W
3513	4822 116 52276	3k9 5% 0,5W
3514	4822 116 52276	3k9 5% 0,5W
3515	4822 117 12955	2k7 1% 0,1W
3516	4822 117 12955	2k7 1% 0,1W
3517	4822 051 10102	1k 2% 0,25W
3518	4822 051 10102	1k 2% 0,25W
3519	4822 051 20333	33k 5% 0,1W
3520	4822 051 20333	33k 5% 0,1W
3521	4822 117 10965	18k 1% 0,1W
3522	4822 117 10965	18k 1% 0,1W
3525	4822 051 10102	1k 2% 0,25W
3526	4822 051 10102	1k 2% 0,25W
3527	4822 051 10102	1k 2% 0,25W
3528	4822 051 10102	1k 2% 0,25W
3529	4822 117 11449	2k2 1% 0,1W
3530	4822 117 11449	2k2 1% 0,1W
3531	4822 117 11449	2k2 1% 0,1W
3532	4822 117 11449	2k2 1% 0,1W
3533	4822 116 52234	100k 5% 0,5W
3534	4822 051 20104	100k 5% 0,1W
3535	4822 051 20124	120k 5% 0,1W
3536	4822 051 20124	120k 5% 0,1W
3537	4822 051 20333	33k 5% 0,1W
3538	4822 051 20333	33k 5% 0,1W
3539	4822 116 52195	47R 5% 0,5W
3540	4822 117 10833	10k 1% 0,1W
3541	4822 051 10102	1k 2% 0,25W
3542	4822 051 10102	1k 2% 0,25W
3543	4822 051 20332	3k3 5% 0,1W
3544	4822 051 20332	3k3 5% 0,1W
3545	4822 051 20223	22k 5% 0,1W
3546	4822 051 20223	22k 5% 0,1W
3547	4822 117 11139	1k5 1% 0,1W
3548	4822 117 11139	1k5 1% 0,1W
3549	4822 051 20562	5k6 5% 0,1W
3550	4822 117 10834	47k 1% 0,1W
3551	4822 051 20154	150k 5% 0,1W
3552	4822 051 20154	150k 5% 0,1W
3553	4822 051 20334	330k 5% 0,1W
3554	4822 117 10353	150R 1% 0,1W
3555	4822 051 20391	390R 5% 0,1W
3556	4822 051 20122	1k2 5% 0,1W
3557	4822 117 11149	82k 1% 0,1W
3558	4822 053 20225	2M2 5% 0,25W

RESISTORS

3559	4822 051 20225	2M2 5% 0,1W
3560	4822 051 20475	4M7 5% 0,1W
3563	4822 117 11449	2k2 1% 0,1W
3564	4822 117 11449	2k2 1% 0,1W
3565	4822 051 20472	4k7 5% 0,1W
3566	4822 051 20472	4k7 5% 0,1W
3569	4822 051 20472	4k7 5% 0,1W
3570	4822 051 20472	4k7 5% 0,1W
3571	4822 051 20472	4k7 5% 0,1W
3572	4822 051 20472	4k7 5% 0,1W
3573	4822 051 20472	4k7 5% 0,1W
3574	4822 051 20472	4k7 5% 0,1W
3575	4822 117 11503	220R 1% 0,1W
3576	4822 116 83872	220R 5% 0,5W
3577	4822 051 20471	470R 5% 0,1W
3578	4822 051 20471	470R 5% 0,1W
3579	4822 052 10478	4R7 5% 0,33W
3580	4822 117 12955	2k7 1% 0,1W
3581	4822 117 11449	2k2 1% 0,1W
3582	4822 117 11449	2k2 1% 0,1W
3583	4822 117 11503	220R 1% 0,1W
3584	4822 117 11503	220R 1% 0,1W
3585	4822 117 10834	47k 1% 0,1W
3586	4822 117 10834	47k 1% 0,1W
3587	4822 051 20154	150k 5% 0,1W
3588	4822 051 20154	150k 5% 0,1W
3589	4822 117 11449	2k2 1% 0,1W
3590	4822 117 11449	2k2 1% 0,1W
3591	4822 051 20223	22k 5% 0,1W
3592	4822 051 20223	22k 5% 0,1W
3593	4822 116 52264	27k 5% 0,5W
3594	4822 051 20273	27k 5% 0,1W
3595	4822 051 20333	33k 5% 0,1W
3596	4822 117 10834	47k 1% 0,1W
3597	4822 051 20105	1M 5% 0,1W
3598	4822 051 20475	4M7 5% 0,1W
3599	4822 116 52175	100R 5% 0,5W
3601	4822 051 20332	3k3 5% 0,1W
3602	4822 051 20332	3k3 5% 0,1W
3603	4822 051 20684	680k 5% 0,1W
3604	4822 051 20684	680k 5% 0,1W
3605	4822 117 13579	220k 1% 0,1W
3606	4822 117 13579	220k 1% 0,1W
3607	4822 116 83864	10k 5% 0,5W
3608	4822 116 83864	10k 5% 0,5W
3609	4822 117 10833	10k 1% 0,1W
3610	4822 117 10833	10k 1% 0,1W
3611	4822 051 20562	5k6 5% 0,1W
3612	4822 051 20562	5k6 5% 0,1W
3613	4822 051 20562	5k6 5% 0,1W
3614	4822 051 20562	5k6 5% 0,1W
3615	4822 051 20562	5k6 5% 0,1W
3616	4822 051 20562	5k6 5% 0,1W
3617	4822 051 20822	8k2 5% 0,1W
3618	4822 051 20822	8k2 5% 0,1W
3619	4822 051 20822	8k2 5% 0,1W
3620	4822 051 20822	8k2 5% 0,1W
3621	4822 051 20822	8k2 5% 0,1W
3622	4822 051 20822	8k2 5% 0,1W
3623	4822 117 10834	47k 1% 0,1W
3624	4822 117 10834	47k 1% 0,1W
3625	4822 051 10102	1k 2% 0,25W
3626	4822 051 10102	1k 2% 0,25W
3627	4822 117 11503	220R 1% 0,1W
3628	4822 117 11503	220R 1% 0,1W
3629	4822 117 11454	820R 1% 0,1W
3631	4822 117 11454	820R 1% 0,1W
3632	4822 116 52231	820R 5% 0,5W
3633	4822 051 20562	5k6 5% 0,1W
3634	4822 051 20562	5k6 5% 0,1W
3635	4822 117 10833	10k 1% 0,1W
3636	4822 117 10833	10k 1% 0,1W
3637	4822 117 10834	47k 1% 0,1W
3638	4822 117 10834	47k 1% 0,1W
3639	4822 117 10833	10k 1% 0,1W
3640	4822 117 10833	10k 1% 0,1W
3641	4822 052 10109	10R 5% 0,33W
3642	4822 051 20472	4k7 5% 0,1W
3643	4822 051 20472	4k7 5% 0,1W
3645	4822 051 20479	47R 5% 0,1W
3646	4822 051 20479	47R 5% 0,1W
3647	4822 051 20479	47R 5% 0,1W
3648	4822 051 20479	47R 5% 0,1W
3649	4822 051 20479	47R 5% 0,1W
3650	4822 051 20479	47R 5% 0,1W
3651	4822 051 20392	3k9 5% 0,1W
3652	4822 051 20392	3k9 5% 0,1W
3655	4822 116 83864	10k 5% 0,5W
3656	4822 117 10833	10k 1% 0,1W
3657	4822 051 10102	1k 2% 0,25W
3658	4822 051 20562	5k6 5% 0,1W
3660	4822 051 20472	4k7 5% 0,1W
3661	4822 053 20475	4M7 5% 0,25W
3662	4822 051 10102	1k 2% 0,25W
3663	4822 051 10102	1k 2% 0,25W
3667	4822 051 20562	5k6 5% 0,1W
3668	4822 051 20562	5k6 5% 0,1W
3671	4822 117 13579	220k 1% 0,1W
3672	4822 117 13579	220k 1% 0,1W
3673	4822 117 12955	2k7 1% 0,1W
3674	4822 051 20334	330k 5% 0,1W
3675	4822 051 20392	3k9 5% 0,1W

3676	4822 051 20101	100R 5% 0,1W
3677	4822 051 20471	470R 5% 0,1W
3678	4822 117 13579	220k 1% 0,1W
3679	4822 051 20391	390R 5% 0,1W
3680	4822 051 20471	470R 5% 0,1W
3681	4822 052 10229	22R 5% 0,33W
3682	4822 051 10102	1k 2% 0,25W
3683	4822 051 20471	470R 5% 0,1W
3684	4822 051 20392	3k9 5% 0,1W
3686	4822 117 11383	12k 1% 0,1W
3687	4822 117 11383	12k 1% 0,1W
3688	4822 117 11383	12k 1% 0,1W
3689	4822 117 11383	12k 1% 0,1W
3690	4822 051 20109	10R 5% 0,1W
3691	4822 051 20109	10R 5% 0,1W
3692	4822 117 10833	10k 1% 0,1W
3693	4822 051 20562	5k6 5% 0,1W
3693	4822 117 11449	2k2 1% 0,1W
3694	4822 051 20562	5k6 5% 0,1W
3695	4822 116 81154	2R2 5% 0,5W
3696	4822 117 11449	2k2 1% 0,1W
3697	4822 116 83883	470R 5% 0,5W
3698	4822 116 83883	470R 5% 0,5W
3699	4822 050 11002	1k 1% 0,4W
3773	4822 051 10102	1k 2% 0,25W
4516	4822 051 20008	0R Jumper 0805
4517	4822 051 20008	0R Jumper 0805
4518	4822 051 20008	0R Jumper 0805
4519	4822 051 20008	0R Jumper 0805
4520	4822 051 20008	0R Jumper 0805
4521	4822 051 20008	0R Jumper 0805
4522	4822 051 20008	0R Jumper 0805
4524	4822 051 20008	0R Jumper 0805
4525	4822 051 20008	0R Jumper 0805
4526	4822 051 20008	0R Jumper 0805
4527	4822 051 20008	0R Jumper 0805
4528	4822 051 20008	0R Jumper 0805
4529	4822 051 20008	0R Jumper 0805
4530	4822 051 20008	0R Jumper 0805
4531	4822 051 20008	0R Jumper 0805
4532	4822 051 20008	0R Jumper 0805
4533	4822 051 20008	0R Jumper 0805
4534	4822 051 20008	0R Jumper 0805
4535	4822 051 20008	0R Jumper 0805
4536	4822 051 20008	0R Jumper 0805
4537	4822 051 20008	0R Jumper 0805
4538	4822 051 20008	0R Jumper 0805
4540	4822 051 20008	0R Jumper 0805
4541	4822 051 20008	0R Jumper 0805
4542	4822 051 20008	0R Jumper 0805
4543	4822 051 20008	0R Jumper 0805
4544	4822 051 20008	0R Jumper 0805
4545	4822 051 20008	0R Jumper 0805
4546	4822 051 20008	0R Jumper 0805
4547	4822 051 20008	0R Jumper 0805
4548	4822 051 20008	0R Jumper 0805
4549	4822 051 20008	0R Jumper 0805
4550	4822 051 20008	0R Jumper 0805
4552	4822 051 20008	0R Jumper 0805
4553	4822 051 20008	0R Jumper 0805
4554	4822 051 20008	0R Jumper 0805
4555	4822 051 20008	0R Jumper 0805
4556	4822 051 20008	0R Jumper 0805
4557	4822 051 20008	0R Jumper 0805
4558	4822 051 20008	0R Jumper 0805
4559	4822 051 20008	0R Jumper 0805
4560	4822 051 20008	0R Jumper 0805
4561	4822 051 20008	0R Jumper 0805
4562	4822 051 20008	0R Jumper 0805
4563	4822 051 20008	0R Jumper 0805
4564	4822 051 20008	0R Jumper 0805
4565	4822 051 20008	0R Jumper 0805
4567	4822 051 20008	0R Jumper 0805
4568	4822 051 20008	0R Jumper 0805
4569	4822 051 20008	0R Jumper 0805
4570	4822 051 20008	0R Jumper 0805
4571	4822 051 20008	0R Jumper 0805
4572	4822 051 20008	0R Jumper 0805
4573	4822 051 20008	0R Jumper 0805
4574	4822 051 20008	0R Jumper 0805
4575	4822 051 20008	0R Jumper 0805
4576	4822 051 20008	0R Jumper 0805
4577	4822 051 20008	0R Jumper 0805
4579	4822 051 20008	0R Jumper 0805
4580	4822 051 20008	0R Jumper 0805
4581	4822 051 20008	0R Jumper 0805
4582	4822 051 20008	0R Jumper 0805
4583	4822 051 20008	0R Jumper 0805
4584	4822 051 20008	0R Jumper 0805
4585	4822 051 20008	0R Jumper 0805
4586	4822 051 20008	0R Jumper 0805
4587	4822 051 20008	0R Jumper 0805
4588	4822 051 20008	0R Jumper 0805
4589	4822 051 20008	0R Jumper 0805
4590	4822 051 20008	0R Jumper 0805
4591	4822 051 20008	0R Jumper 0805
4592	4822 051 20008	0R Jumper 0805
4593	4822 051 20008	0R Jumper 0805
4595	4822 051 20008	0R Jumper 0805
4599	4822 051 20008	0R Jumper 0805
4600	4822 051 20008	0R Jumper 0805
4601	4822 051 20008	0R Jumper 0805

ELECTRICAL PARTS LIST - AF7 BOARD

RESISTORS

4602	4822 051 20008	0R Jumper 0805
4603	4822 051 20008	0R Jumper 0805
4605	4822 051 20008	0R Jumper 0805
4606	4822 051 20008	0R Jumper 0805
4607	4822 051 20008	0R Jumper 0805
4609	4822 051 20008	0R Jumper 0805
4611	4822 051 20008	0R Jumper 0805
4612	4822 051 20008	0R Jumper 0805
4613	4822 051 20008	0R Jumper 0805
4614	4822 051 20008	0R Jumper 0805
4615	4822 051 20008	0R Jumper 0805
4618	4822 051 20008	0R Jumper 0805
4619	4822 051 20008	0R Jumper 0805
4620	4822 051 20008	0R Jumper 0805
4621	4822 051 20008	0R Jumper 0805
4622	4822 051 20008	0R Jumper 0805
4623	4822 051 20008	0R Jumper 0805
4624	4822 051 20008	0R Jumper 0805
4625	4822 051 20008	0R Jumper 0805
4627	4822 051 20008	0R Jumper 0805
4629	4822 051 20008	0R Jumper 0805
4715	4822 051 20008	0R Jumper 0805
4716	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5511	4822 157 62552	Coil 2,2μH 5%
5523	4822 157 62552	Coil 2,2μH 5%
5531	4822 157 62552	Coil 2,2μH 5%
5532	4822 157 62552	Coil 2,2μH 5%
5611	4822 157 62552	Coil 2,2μH 5%

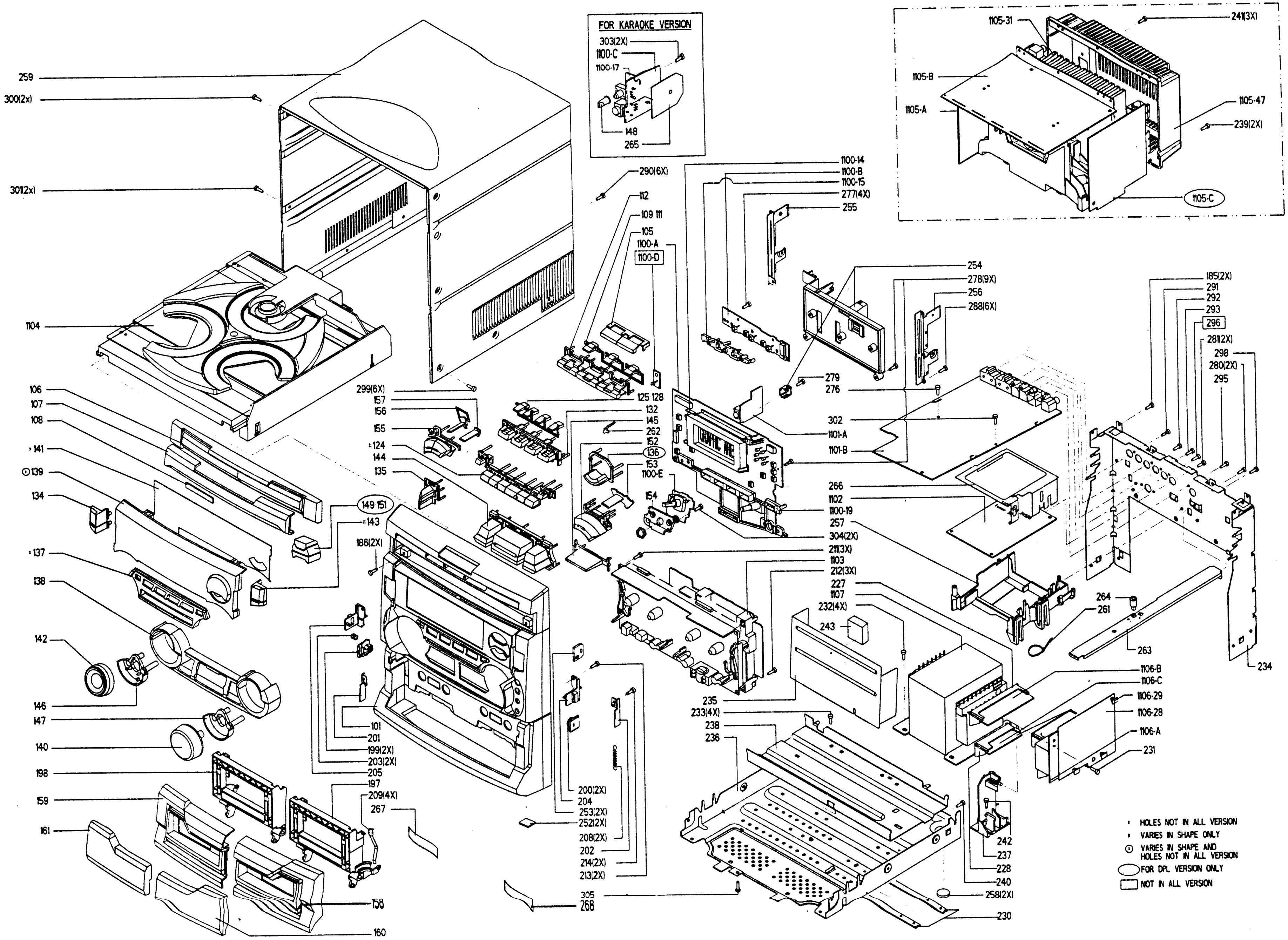
DIODES

6511	4822 130 30862	BZX79-C9V1
6512	4822 130 30862	BZX79-C9V1
6514	4822 130 31878	1N4003G
6515	4822 130 30621	1N4148
6516	4822 130 30621	1N4148
6517	4822 130 30621	1N4148
6531	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7511	4822 209 17386	TDA7437T
7512	4822 209 83357	NJM4560M
7513	4822 209 83357	NJM4560M
7515	4822 209 31378	NJM4556AM
7521	4822 130 60511	BC847B
7522	4822 130 60511	BC847B
7523	4822 130 60511	BC847B
7524	4822 130 60511	BC847B
7525	4822 130 40959	BC547B
7526	5322 130 60508	BC857B
7527	4822 130 60511	BC847B
7528	4822 130 60511	BC847B
7529	5322 130 60508	BC857B
7531	4822 130 60511	BC847B
7532	4822 130 60511	BC847B
7533	4822 130 60511	BC847B
7534	4822 130 60511	BC847B
7535	4822 130 42804	BC817-25
7536	4822 130 42804	BC817-25
7537	4822 130 60511	BC847B
7538	4822 130 60511	BC847B
7539	5322 130 60508	BC857B
7541	4822 130 60511	BC847B
7542	4822 130 60511	BC847B
7543	4822 130 42804	BC817-25
7551	4822 209 17345	M62320FP
7552	4822 130 41246	BC327-25
7553	4822 130 60511	BC847B

Note : Only the parts mentioned in this list are normal service spare parts.


FOR KARAOKE VERSION
303(2X)
1100-C
1100-17
148
265
259
300(2x)
301(2x)
1104
106
107
108
141
139
134
137
138
142
146
147
140
198
159
161
158
160
299(6X)
157
156
155
124
144
135
149 151
143
186(2X)
101
201
199(2X)
203(2X)
205
197
209(4X)
267
290(6X)
112
109 111
105
1100-A
1100-D
125 128
132
145
262
152
136
153
1100-E
154
200(2X)
204
253(2X)
252(2X)
208(2X)
202
214(2X)
213(2X)
305
268
1100-14
1100-B
1100-15
277(4X)
255
254
278(9X)
256
288(6X)
279
276
302
1101-A
1101-B
266
1102
1100-19
257
304(2X)
211(3X)
1103
212(3X)
227
1107
232(4X)
243
235
233(4X)
238
236
1105-31
241(3X)
1105-B
1105-A
1105-47
239(2X)
1105-C
185(2X)
291
292
293
296
281(2X)
298
280(2X)
295
264
261
263
234
1106-B
1106-C
1106-29
1106-28
1106-A
231
242
237
228
240
258(2X)
230

* HOLES NOT IN ALL VERSION
* VARIES IN SHAPE ONLY
⊙ VARIES IN SHAPE AND HOLES NOT IN ALL VERSION
○ FOR DPL VERSION ONLY
☐ NOT IN ALL VERSION

PCS 102 650

MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT

101	4822 459 05298		Cabinet Front
105	4822 410 12461		Button CDC Open/Close
106	4822 442 01845		Cover Tray CDC
107	4822 442 01846		Cover Tray Orn
108	4822 454 13035		Badge Philips
112	4822 410 12297		Button Set CDC Select
124	4822 410 12542		Button Set Ctrl
132	4822 410 12543		Button Set S-Sel
134	4822 410 12465		Button Set Stdby/Timer
135	4822 410 12466		Button Set Dubbing/Rec
137	4822 442 01924		Cover Orn Ctrl
138	4822 442 01925		Cover Orn SNP
139	4822 450 10701		Window Display
140	4822 410 12544		Knob Volume Rotary
142	4822 410 12468		Jog Rotary
143	4822 442 01923		Cover RDS/NEWS
144	4822 410 12546		Button Set SNP
148	4822 410 12472		Knob Karaoke
152	4822 410 12547		Button Set Max Sound
155	4822 410 12548		Button Set Enter/More
158	4822 443 11282		Cover Cassette Right
159	4822 443 11279		Cover Cassette Left
160	4822 442 01918		Lens Cassette Right
161	4822 442 01919		Lens Cassette Left
197	4822 443 10488		Door Cassette Right
198	4822 443 10487		Door Cassette Left
199	4822 402 10621		Push-Catch
200	4822 529 10322		Damper Assembly
203	4822 492 11344		Spring Compression
204	4822 402 11246		Bracket Right
205	4822 402 11245		Bracket Left
208	4822 492 11345		Spring Tension
209	4822 492 42787		Spring Cassette
252	4822 462 40683		Foot Rubber
254	4822 466 12197		Plate Front
258	4822 462 40683		Foot Rubber
259	4822 426 10807		Cabinet Rear
349	4822 445 10857		Surround Speaker /37
350	4822 445 10869		LS Pair To Left /21
350	4822 445 10871		LS Pair To Right /21
350	4822 445 10863		LS Pair To Left /37
350	4822 445 10864		LS Pair To Right /37
351	4822 303 50063		FM Aerial /21
351	4822 320 11094		FM Aerial /37
356	4822 219 10683		Remote Control
384	4822 303 50082		AM Frame Aerial
385	4822 321 10249	△	Mains Cord /21
385	4822 321 11466	△	Mains Cord /37
387	4822 736 17113		Instruction For Use /21
387	4822 736 17112		Instruction For Use /37
1107	4822 146 11146	△	Mains Transformer /21
1107	4822 146 11194	△	Mains Transformer /37
1200	4822 320 12657		Flex Cable BD 19P 560mm
1201	4822 320 12661		Flex Cable BD 19P 400mm
1202	4822 320 12653		Flex Cable BD 6P 150mm
1204	4822 320 12713		Flex Cable AD 6P 340mm Folded
1205	4822 320 12752		Flex Cable AD 7P 180mm
1206	4822 320 12654		Flex Cable AD 7P 220mm

LEFT/RIGHT LOUDSPEAKER BOX BREAKDOWN

4822 240 10397	Woofer 6,5" 6R 100W
4822 240 10398	Tweeter 2,5"
4822 248 10011	Plug Wiring W/Piezo Assembly
4822 325 50229	Grommet
4822 458 10692	Cloth Frame Assembly Left
4822 458 10693	Cloth Frame Assembly Right

SURROUND BOX BREAKDOWN

4822 240 10388	Speaker 4" 12R 20W /37

Note : Only the parts mentioned in this list are normal service spare parts.

SCREW LISTS - MAIN UNIT

185	D3 x 10
186	D3 x 10
211	D3 x 12
212	D3 x 12
213	D3 x 12
214	D3 x 12
231	D3 x 10
232	M3 x 10
233	M3 x 6
239	M3 x 10
240	D3 x 12
241	M3 x 10
242	M3 x 10
276	D3 x 12
277	D3 x 12
278	D3 x 12
279	M3 x 12
280	D3 x 12
281	D3 x 12
288	D3 x 10
290	M3 x 10
291	D3 x 12
292	D3 x 12
293	D3 x 12
295	D3 x 12
298	M3 x 10
299	M3 x 10
300	M3 x 10
301	M3 x 10
302	M3 x 16
303	D3 x 12
304	D3 x 12
305	M3 x 6